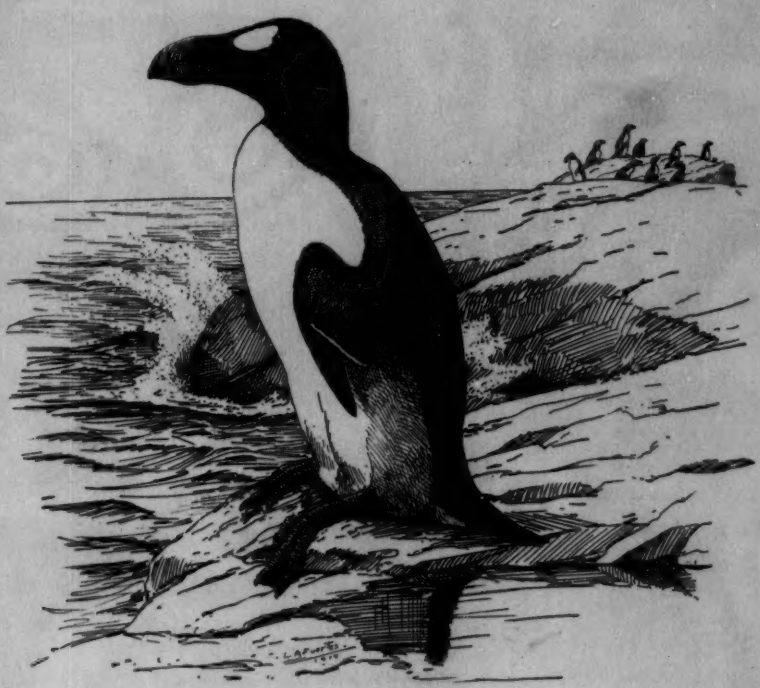
H. H. Poor

Old Series, Vol. LIX | CONTINUATION OF THE BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB | New Series, Vol. LI

The Auk

A Quarterly Journal of Ornithology

Vol. LI APRIL, 1934 No. 2



PUBLISHED BY

The American Ornithologists' Union

LANCASTER, PA.

Entered as second-class mail matter in the Post Office at Lancaster, Pa.

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A QUARTERLY JOURNAL OF

ORNITHOLOGY.

VOL. LI. APRIL, 1934. No. 2.

THE MT. SANGAY LABYRINTH AND ITS FAUNA.[1]

BY ROBERT T. MOORE.

Plates VI–VII.

MORE than fifty years ago Edward Whymper, pausing in his triumphant descent from the first conquest of Mt. Chimborazo, the giant of the Ecuadorian Andes, caught sight of a formidable volcano nearly fifty miles to the southeast. The blasé conqueror of the Matterhorn was amazed at the outburst taking place before his eyes. He made drawings of the eruptions, which he then presumed were "outrushes of steam" and calculated the velocity of ejection, determining it as "twenty-two miles per minute"! Whymper undoubtedly witnessed the early stages of one of the major eruptions which take place at periodic intervals, ranging from a few years to fifty or more. Twelve years later in 1892, when writing his great classic,[2] he expressed astonishment that a volcano so formidable should be known to Ecuadorians "only by name"! Whymper did not seem to know that thirty-four years earlier Villavicencio had indicted Sangay as the "most frightful volcano in the World."[3] Nor did his book reveal acquaintance with the observations of non-Ecuadorian scientists and explorers who, for two centuries, had borne testimony to its devastating power.

As early as 1739 Monsieur de la Condamine witnessed a violent eruption which seemed to him "to set on fire the whole mountain

[1] Contribution from the California Institute of Technology; Read at the Fifty-first Stated Meeting of the A. O. U., New York, November 14, 1933.

[2] Travels Amongst the Great Andes of the Equator by E. Whymper, p. 73.

[3] Geografia de la Republica del Equador, p. 51, New York, 1858.

and its crater," while a "burning river of sulphur and bitumen took its course in the midst of the snowy slopes."[1]

The geologist Reiss, moreover, gave an amazing testimony to its energy, when he stated that for four years without intermission a stream of incandescent lava flowed from the western shoulder of the volcano.[2] Many observers have noted that the roarings of the volcano have been heard in Guayaquil, one hundred and ten miles across the Andes, and sea captains far out in the Pacific have seen the decks of their vessels drifted with its ashes. So great is the mass ejected, Reclus assures us, that it would equal that of several mountains.[3] "It seems probable," adds Dr. Mozans, "that the disastrous earthquake which destroyed the old city of Riobamba in 1797 had its origin in Sangay. So complete and sudden was this visitation that few of the twenty thousand inhabitants were able to escape."[4] And then come the fables and legends which always cling to the skirts of terrifying phenomena. "Everyone had heard of the 'Flaming Terror to the East of the Andes,'" said Commander Dyott, "but no one had ever ventured near it. Within several leagues of its base (so ran the tale) were lakes whose waters spouted high in the air, drenching the country for miles around and forming a sort of water barrage."[5] And even the renowned Humboldt did not help dissolve this atmosphere of superstition by describing a fish, "Pimelodus cyclopum," which he says was thrown out in great numbers during minor eruptions of Cotopaxi, Tungurahua, and Sangay.[6] I have not space to quote from Wolf, Stübel, Hans Meyer, Stevenson, and many others who have observed the demonstrations of Sangay. A final quotation from the El Telegrafo at Guayaquil will suffice: "Alfonso Stübel . . . initiated an attempt to creep up on the shoulders of the colossus in April of 1872, but he, like G. M. Dyott, the intrepid Andean explorer, had to abandon the enterprise, their audacity punished by the imminence of destruction."[7] There seems to be no record that anyone actually

[1] See Ecuador by C. Reginald Enoch, p. 163, and La Condamine, Voy., p. 77.
[2] Reiss, Zeitschrift der deutschen geologischen Gesellschaft, XXVI, p. 93.
[3] Nouvelle Geographic Universelle, Vol. XVIII, p. 422 by Reclus.
[4] Along the Andes and Down the Amazon, p. 76, by A. H. Mozans.
[5] The Volcanoes of Ecuador by G. M. Dyott in National Geographic Magazine for January, 1929. Also see book: On the Trail of the Unknown, by same author.
[6] Zoology of Humboldt's and Bonpland's Journey, Vol. 1, pp. 21–25.
[7] El Telegrafo, August 25, 1929.

crossed the snow-line until November of 1925,[1] when Commander Dyott after months of effort came to grips with the ice-field. On his first attempt he was struck down with snow-blindness and on his second fell into a dangerous crevasse on the southeastern shoulder, while his companion was incapacitated by siroche, both finally abandoning the effort. El Telegrafo concludes, "Sangay continued to guard its mystery inviolate—a mystery vast and sublime!"

Familiarity breeds contempt for mysteries, legends, and the fears that they produce. After one has threaded the abysses about the base of Sangay and surmounted its pall of cloud, a solution of these so-called mysteries becomes possible. Detached from the main chain of the eastern Andes, Sangay juts out over the Amazon basin, a lonely sentinel nearly 18,000 feet in altitude. Although only about one hundred and fifty miles south of the equator, the last half mile of altitude is covered with a crown of ice and snow. At the eastern base of the mountain begins an interminable plain of tropical forest which stretches without break three thousand miles to the Atlantic. So impenetrable are these jungles of the steep eastern slope that no one has made an attack on the summit from this side. On the other three sides are one thousand square miles of volcanic ash, which have been carved by tropical rains into a labyrinth of black canyons 500 to 2,000 feet deep. Down each one swirls an angry torrent—the whole constituting a veritable maze, whose deeper intricacies have never been threaded by the superstitious Indians living about its margins. They never cross its borders save for an occasional forage among the rare wild animals, who here have made their last stand in a sanctuary created by superstition. Above and about it all has been hung by Nature a vast shroud of mist and cloud, which is lifted but for brief intervals.

After twenty-six days of constant rains we climbed above the Shroud and at an elevation of 16,000 feet discovered its cause. Humid currents of air, superheated in the cauldron of the Amazon basin, are forced upward by the tendency of heat to rise. Ascend-

[1] National Geographic Magazine, January, 1929. Commander Dyott does not state either in his book or article the year in which his effort was made. From other sources it seems to have taken place in 1925.

ing the 18,000 foot slope they enter an area, progressively cooling, and soon reach the frigid atmosphere about the snow-fields. The rapid decrease of temperature sucks the air columns upward at ever greater speed. The contact of heated currents with freezing temperatures results in rapid condensation and vast billowing clouds are born in a moment before the astounded eyes of the climber. This process keeps up for days, if not months, the "mushrooming" clouds joining the Shroud to the west and constantly recreating it at about the 16,000 foot level. The rains congeal on the upper slopes and thicken the collar of snow and ice. When Sangay blows off its cap, the snow-field dissolves in a moment and the Labyrinth at its base is choked with a stupendous deluge of water and ice, cascading down the precipitous sides. The melting ice and snow make the canyons boil and churn tumultuously and the enormous masses of ash, catapulted out of the crater, choke the canyons and destroy almost every vestige of plant and tree life. A few stunted trees seem to survive on the tops of the high ridges between the canyons, and the warmer conditions at the bottom during periods of quiescence create a scanty amount of shrubbery and small trees. On the sides of the gray canyon walls, except on the slopes of the northwest margin of the Labyrinth, are found today little else but clumps of a large grass with a sword-edge known to the natives as "paja." This would seem to establish all but the bottom of the canyons and a few tongues of tree growth, extending up the sides, as Paramo Zone.

A third impediment to explorers of this region lies in the superstitious fears of the native cargo bearers. Terrified by every manifestation of the great volcano, they abandon the explorer at sight of its white cone, appearing through a rift of the Shroud. Three times our party was deserted by different groups or individuals, which at Tres Aguas threatened disaster. With tents leaking, ammunition and food supplies wet and fires refusing to catch flame, our party was in danger either of being washed out or weakened by lack of food. A fortunate kill of deer relieved the tension until four days later a new group of Indians was brought up from Alao.

It seems strange that birds, possessing enduring powers of flight, such as Thrushes and Hummingbirds, would make their homes in

UPPER: MT. SANGAY FROM CULEBRILLAS VALLEY. JUNCTION OF HUMID TEMPERATE ZONE WITH PARAMO. LEFT CENTER, APERTURE OF CANON WHERE TEPHROPHILUS WAS COLLECTED.

LOWER: CAMP SITE ON DRIER HUMP OF MORASS OF CULEBRILLAS VALLEY.

canyons such as these. The natives claim that it rains every day of the year in the Sangay area and our experiences offer no proof to the contrary. It actually rained every one of the twenty-six days of our safari. Even when we climbed through the Shroud, to the cone of Sangay, snow fell intermittently about the peak and the Indians, who refused to budge from the base camp at the 14,000 foot level, stated that the rains had continued during our two days' absence. Yet throughout this period several pairs of the Hummingbird, *Metallura atrigularis* Salv., continued to build their nests in a scattered colony among the overhanging grass roots and vines of a cliff at the bottom of one of the canyons. We had named it Dorado Valley from the name employed by them to designate this Hummingbird, under the belief it was the same as *Metallura primolina* Bourc., a bird of northern Ecuador with which they were familiar. They had overlooked the black throat of this mite. On July 27, 1929, I found what seems to be the first nest of the species to be discovered, at the base of hanging "paja" grasses, not three feet above the torrent of Dorado Valley. It was exquisitely situated beside a large rock in the stream. The Hummingbird flew to it several times, watched, making some additions to the nest which was practically completed. Eleven days later on August 7, after our return from Sangay, the nest contained two eggs nearly fresh and the female bird was collected as she was flying to it with a bit of white vegetable matter resembling cotton. In spite of the fact that the rains had continued incessantly throughout the period with only one or two respites of an hour's duration, the bird had stuck to her task, even though the nest must have been water-soaked from the bank above throughout the period. A nest of another Hummingbird, *Chalcostigma herrani* (Delatt. & Bourc.), was found on a perpendicular cliff about twenty feet above the water among some ferns and hanging vines that fairly dripped with water. The nest was discovered on July 19 by Terris Moore and yet on August 7 the female was observed repeatedly carrying material to it, although mist and drizzle were falling and water was dripping in streams from the plants about it and the outside of the nest itself. Despite the interval of eighteen days, no eggs had been deposited, and yet this Hummingbird had persisted in building operations throughout the depressing weather conditions.

On July 15, 1929, my party consisting of my son Terris Moore of Williams College, Waddell Austin of the University of California, Lewis Thorne of Yale University, and three Quichua collectors, with myself as leader, found ourselves in the public square of the Indian village of Licto. Here our genial host, Senor Alphonse Merino, on whose courtesies and thoughtfulness the success of our enterprise largely depended, introduced us to our caravan of eight horses and ten pack mules.

The following morning our equipment of tents and blankets, of guns and traps, of cameras, color plates and films, were packed on the backs of eleven Indians and off they dog-trotted up the valley of Alao. Here was a paradise of balmy Andean sun-light and gorgeous flowers. The latter grouped in great clumps on either side of the trail along the stream that leaped from rock to rock down the center of the valley. Calceolarias proffered great clusters of golden slippers. "Taxcus" climbed here and there through the thick growth and dropped overhead their great pink trumpets. Large patches of the orange parasite, called locally "picapus," brought beauty to the tree tops and lured the Sunbeams[1] to investigate. But the glory of the valley was the wild fuchsia. Superb scarlet bells hung in every conceivable line of grace, and tempted Hummingbirds of several species to explore their chalices. On all this loveliness of flower and dashing water the tropical sun shone with a balmy intensity found only in favored Andean valleys.

But beauty and sunlight had to be left behind when we began the steep ascent of the southern rim of the valley. For a while sunlit glimpses of the hacienda could be caught through the heavy tree-growth that clung to the lower walls, but shortly thereafter we reached the wind-swept paramo and under the wings of inquisitive Condors, began our long trek beneath the pall of cloud and mist, which we came to call, "The Shroud" of Sangay. From this time on rain fell every day for the next twenty-six with only occasional parting of cloud masses. Sometimes it drenched us with sudden outbursts, sometimes it swathed us in chill mist, but for the most part contented itself with a monotonous drip, drip, drip—day after day—that gradually sapped ambition and ren-

[1] *Aglaeactis cupripennis cupripennis* (Bourc. & Muls.), a common but beautiful Hummingbird of high Andean valleys from 10,000 to 13,500 feet altitude.

dered minor chores a Herculaean task. With the sunlight disappeared all semblance of a trail. Our first camp was pitched at the top of a high pass to the accompaniment of bleak winds and the howling of many dogs. The Indians insisted on taking these gaunt and ravenous creatures to help in hunting tapir and deer.

For thirteen days we followed the general course pursued by Commander George Dyott as far as his "Windy Ridge" camp.[1] Because of deserting Indians and other difficulties only about four registered progress. Throughout this period we occasionally happened on machete marks on shrub or tree, where Dyott had passed. After the thirteenth day we descended into deep canyons and never came across his marks again. It is impossible within the limits of this article to tell the many incidents and "near-disasters" of these difficult days. Kaleidoscopic views of rather loosely related events are the best I can attempt.

Towards the end of one day of almost constant climbing, we reached the top of a high pass. The wind howled through the gap on a temperature close to freezing and drove us down the opposite slope for protection. My field-notes remark: "Trails there are none, except the bed of a stream. For hours we have stumbled and slipped over hummocks of paja, forever stubbing our toes and dropping into concealed gullies. We are thoroughly soaked. Wading the icy stream seems preferable to the pounding that toes and ankles are taking. The earth has assumed the consistency of a super-charged sponge. We have forded many streams." As the light darkened and the billowing Shroud sagged into the valley, we located the remains of Commander Dyott's second camp-site in Culebrillas Valley. We pitched our tents in the dryest spot we could find in the huge morass which filled almost the entire floor of the valley, and that same night obtained our first view of Sangay, seventy degrees E. of S. Incredibly high it stood against the southern sky, ghostly and wan in a flood of moonlight. It seemed to fill the whole end of the valley. And yet it must have been twenty-five miles away. But distance conveyed no feeling of safety, when an earthquake that night brought us to our feet!

[1] The Volcanoes of Ecuador, by G. M. Dyott, in National Geographic Magazine for January, 1929. Also see his volume: On the Trail of the Unknown.

We had now reached the margin of the real Labyrinth. Our valley faced approximately southeast directly towards Sangay and not far away in that direction began the intricate system of canyons that we later termed the "Labyrinth." If we wanted to proceed very far into it, a route straight down the valley would mean nothing but endlessly crossing canyon after canyon. The valley wall on the southern side seemed to be heading in the approximate direction we wanted to go. It was decided that Lewis and Terris should climb the wall and follow it in order to ascertain if it continued for any distance and would afford an easier access to the heart of the Labyrinth. While this reconnaissance was being made, the rest of the party was to stay in Culebrillas and secure a representation of its bird-life. Comment at this point from my field notes forecasts the difficulties that were to come.

"Vinci, the leader of the peons, refuses to move with the reconnaissance party. He claims rheumatism! We suspect cowardice. He even refuses to let his peons advance without him, exclaiming 'There are no trails! We have to cut through with machetes!' A threat of punishment from his master, Senor Merino, brings him to terms. His sullen look as he leaves indicates no desire to cooperate."

As we watched the boys lightly plunge up to their waists into the main river, the rest of us gave attention to the exploration of the valley. The floor of it was fairly flat, except at the southeast end where it was broken up by the black front of an old lava flow, which probably had its origin in Sangay. The altitude was approximately 11,000 feet, whereas the mountains which framed in the valley rose to an elevation of approximately 13,000 to 14,000. The entire floor consisted of a vast water-soaked swamp of "paja," through which wound numerous small streams that emptied into the Rio Culebrillas. A fairly heavy tree-growth covered the lower slopes of the mountain walls but their low height and gnarled condition reflected the high altitude and severe climate. Small water-falls dropped here and there down the slopes through the tree-growth and attracted a few insects, which in turn lured the five species of Hummingbirds that were found in the valley. The most conspicuous was the large Hummer, *Pterophanes cyanopterus* (Fraser), its ultramarine wings flashing back and forth against the sunlit spray. It created a lasting memory of color and grace in

motion. The bird hurls through the air at great velocity for so large a Hummingbird and recalls the motion of its cousin, the Swift. The Sunbeam, *Aglaeactis c. cupripennis* (Bourc. & Muls.), the green-frontleted *Helianthea lutetiae* and *Lafresnayea l. gayi* (Bourc. & Muls.) with its black velvet abdomen and long curved bill were scarcer denizens of the woodland growth. No doubt they fed from the clustered corollas of the parasitic orange "picapus," which in places festooned the moss-covered trees. Of *Metallura atrigularis* Salv., another frequenter of the paja-draped stream beds and hitherto known only from the Sigsig region to the south, I have already spoken. Individuals of the first and last of these species were very common. This seems strange in view of the bleak nature of the valley and the scarcity of both flowers and insects. All told eight different species of Hummingbirds were found in the Sangay area, which might be described as a wilderness of volcanic ash, relieved only here and there by scattered, stunted trees and practically barren of flowers.

But the most conspicuous bird of the valley, because of its abundance and size, was the Snipe, *Capella nobilis* Scl. At every movement through the central marshes, it hurtled into the air and provided an abundant food supply. At sundown ecstatic forms whirled overhead to the accompaniment of strange sounds that reminded one of a deep-pitched policeman's rattle. The old Quichua, Carlos Olalla, insisted that these represented a larger form of Snipe, which he sometimes termed "Sumbador negro." Subsequently specimens were secured of the large gray Snipe, *Capella jamesoni* (Bonap.). The night calls may have represented this species. High up on the paramo of the mountains above Culebrillas Valley, a specimen was taken of the Tinamou, *Nothoprocta curvirostris* Scl. & Salv. A nest with eggs of this short-tailed bird was found on Mt. Pichincha in northcentral Ecuador. A Rail was collected by the author which proved to be a race of our own *Rallus limicola*, namely, *aequatorialis* Sharpe. The lower tail-coverts are largely white, as was noted by Dr. Chapman in specimens from the La Carolina marshes near Quito. Two Ducks were found in the streams, *Nettion andium* (Scl. and Salv.) and *Merganetta colombiana* Des Murs, but neither was conspicuously common. These Ducks were remarkably shy, a characteristic true of

all of the birds of the Sangay area. I attribute this to the fact that such birds as confine themselves to this region rarely or never see human beings, even Indians. The most persistent sound from the marshes was the loud, low-pitched call of the long-legged *Grallaria monticola*, Lafr. This bird dashed about in the runways between the tall clumps of paja and was very difficult to flush. On one occasion I had the opportunity of observing it calling when only a few feet from me. It raised its entire body as well as head and stretched its stilt-like legs to the full limit. When the call was completed, the bird collapsed like a jack-in-the-box. A smaller Ant-Thrush, *Oropezus rufula rufula* (Lafr.), of distinct cinnamon cast, was either much scarcer or else more difficult to flush. Fly-catchers of two or three species haunted the scattered bushes on the dry mounds of the swamp and two large members of the Thrushes, *Turdus fuscater gigantodes* Cab. and *T. chiguanco conradi* Sal. & Fes., confined themselves to the margins of the tree-growth on the sides of the valley. Down at the southeastern end the Rio Culebrillas crossed over to the north side along the front of the lava flow and cut its way down towards the first deep canyon of the Labyrinth quickly reaching the Humid Temperate Zone. Here tree-growth was heavier and in it was found the first Tanager —a large and extremely beautiful bird in green, yellow, blue and black. It proved to be a new race of *Buthraupis eximia*. Two other Tanagers were obtained in the Sangay area, one, a new species, which will be mentioned later; the other, *Dubusia taeniata* (Boiss.), was met with only twice. It is rather interesting that all three of them are included in Sclater's division of the Thraupidae, which he calls "Tanagrinae fortirostres." Two large birds were observed in the valley, one being collected later on the mountains, namely, *Ibycter carunculatus* (Des Murs); the other a handsome red-backed *Buteo*, either *polysoma* or *poecilochrous*, was seen several times. Two individuals of the latter were observed on a dead tree by the Rio Culebrillas a few hundred yards from our tent. One bird was tearing to pieces a freshly killed rabbit and the other, presumably an immature, was getting most of it. The natives call this bird "Aigula" the equivalent of Eagle. A month and a half later I collected a male and female, presumably *B. poecilochrous*,[1]

[1] See Chapman (Dist. Bird Life in Ecuador, pp. 227, 229, on difficulty of differentiating this from *B. polyosoma*.

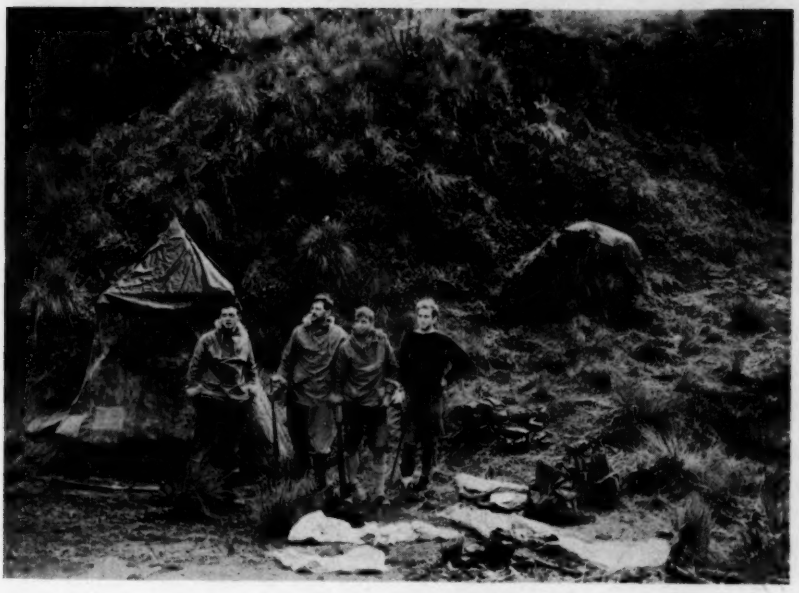
on the northern cliffs of Mt. Chimborazo at an elevation of about 17,000 feet. They were building a nest on a precipitous cliff. The proved mating is interesting as the female is in the dark phase.

Of all the birds of the valley, the species that interested me most consisted of four belonging to the Furnariidae—*Leptasthenura andicola* Scl., *Asthenes flammulata flammulata* (Jard.), *Schizoeaca fuliginosa* (Lafr.), and *Margarornis perlata* (Less.). These birds fed among the drier parts of the morass and, when flushed, flew furtively to the small bushes that dotted the humps of the valley floor. The last with its brick-colored back and large guttate yellow spots, thickly arranged on the olive background of its breast, is an extraordinarily striking bird. Even in the dim light of the Shroud, that was always over our heads, these yellow spots like great tear-drops stood out sharply and lent the only touch of brightness and cheer among the dismally colored birds of the marsh. On the other hand *Schizoeaca* is typical of the duller colored birds, all brown and gray, but its narrow tail feathers with their incomplete barbules somehow recall certain very delicate ferns. The most interesting fact regarding the presence of these four species is that *Margarornis perlata* has been assigned to the Humid Temperate Zone and the other species to the Paramo Zone by Dr. Chapman in his excellent work on the 'Distribution of Bird Life in Ecuador.' With exception of one of the paramo species,—*Leptasthenura andicola andicola* Scl.,—they were all common in the same large swamp with the Snipe, *Capella nobilis*, which, according to Dr. Chapman is chiefly a Temperate Zone bird "ranging upward to the Paramo." The grass-covered floor of the valley certainly has the general appearance of the paramo, but the tree-growth on the borders at the base of the mountain walls forms a continuous connection with the heavier tree-growth of the canyon at the southeast end of the valley and has undoubtedly induced the species of the Humid Temperate Zone to follow the scattered shrubs out on to the floor of the valley. With all hands collecting and Carlos continuing to operate during our absence in the deeper mazes of the Labyrinth, we secured 223 specimens in Culebrillas Valley, including some species not mentioned above, which I feel is quite representative of the bird life there for the summer months.

On the third day Terris and Lewis returned with a luring account of a volcano that stood stark and gaunt on the skeletonic ribs of the Labyrinth, and of a lofty watershed, bisecting it, which proffered an opportunity to climb over its canyons. On the following day, leaving all heavy equipment with Carlos at Culebrillas, the main party crossed Mt. Dorado to the south at an approximate elevation of 14,000 feet, laboriously cutting a way through the gnarled tree-growth with machetes, and plunged down into the wilderness on the other side of the range. My notes remark: "We followed the stream through its boggy home. The paja butted our toes. The torrent filled our boots at unexpected crossings. We slipped in countless mud holes. Late in the afternoon we reached the junction of three rivers, completely 'bogged' as the boys expressed it." A mile from our camping place we passed by the water-soaked cliff where Terris on the reconnaissance had discovered the nest of the fiery-throated Hummingbird, *Chalcostigma herrani* (Delat. & Bourc.). The mossy bottom of the nest in a niche of the cliff was soaked like a sponge and continuously dripped water down the rocks. Nevertheless, the interior was dry. The perseverance of these birds was almost beyond human comprehension. That this feathered electron, splashed with the glorious fire of the tropics, should choose a barren water-soaked wilderness as an abode, left the mentality of luxury-craving humans in complete coma. Incidentally, this nest proved that one species of Hummingbird can tolerate another, for it was placed in the same cliff with the several nests of *Metallura atrigularis* mentioned previously. At the foot of the cliff a pair of the curious Spine-tailed Duck, *Merganetta colombiana* Des Murs, were holding their position against the fierce torrent.

On the right hand side of the narrow valley a fifty foot waterfall spectacularly dropped over a cliff beside an enormous bunch of paja grass which swung its streamers in the clear fifteen feet in length. Beside it, two female Metalluras were building their nests as were also Swallows, *Orochelidon murina* (Cass.), and a bird known locally as the "Chungui grande," *Upucerthia excelsior excelsior* (Scl.).

The Indians named the junction of the rivers which they had never seen, "Tres Aguas" and the main river "El Negro." My notes exclaim: "We are facing the Negro! In its angry waters lurks disaster. The peons refuse to build an adequate 'chozo.' They



UPPER: LABYRINTH LOOKING NORTH FROM EDGE OF CLIFF AT CARNECERIA. CULEBRILLAS VALLEY LIES AMONG MOUNTAINS IN LEFT BACKGROUND.
LOWER: CAMP SITE AT ACTUAL BASE OF MT. SANGAY. HUMMINGBIRD (CHALCOSTIGMA STANLEYI) WAS NESTING IN ARROYA POCKET AT RIGHT.

huddled all night and arose wet and disgruntled. The 'waterproof' covers of our sleeping bags leak like sieves. Films and cartridges are wet. The drenched wood cannot be coaxed into flame. We eat cold meals. We are in a cul-de-sac between mountain walls and can see nothing but fog and mist. Even the two faithful Quichuas are discouraged. When I gave orders to cross the river, the peons revolted. They claimed I was trying to drown them, and added that, if a crossing could be accomplished, the daily rains would swell the river to frightful proportions and prevent a return." Nine of them fled over the mountain, taking with them our only meat—portions of a deer.

A few days later with a fresh group of peons, a crossing was negotiated and we climbed to the tops of the mountain ridges again. At one point we were startled by the sudden appearance of a tiny Hummingbird, darting amidst the fantastic stunted growth that had collected in a gap of the knife-edge. When I picked it up, I discovered it was a female of the extraordinarily beautiful purple-breasted and golden-headed *Rhamphomicron microrhynchum microrhynchum* (Boiss.). Following a knife-like watershed, which gave uncertain footing on its jagged edges, we came to a jutting escarpment, which we called Desolation View. One set of notes remarks: "No one can exaggerate the ghastly panorama that fills the enormous basin below us. It is the Grand Canyon all over again, but this time done in blacks and livid grays and filled with a spectral atmosphere under the impending Shroud." We followed the watershed wherever it twisted and turned through the Labyrinth. Late one afternoon it widened into a plateau, approximately 13,000 feet in altitude and covered with endless paja and a few stunted trees. We camped on the edge of a cliff, nearly 2,000 feet in altitude, which gave awe-inspiring views of the Labyrinth below. From this time on, because of the diminishing number of Indians, double trips had to be taken to previous camping places to bring up supplies. Characteristically disregarding his now badly infected feet, Terris performed most of this double duty. Our faithful Quichua, Teodomiro, was in still worse shape from constantly walking on the gritty ash. Reluctantly we were forced to leave him behind at this camp, which we called Carneceria. The killing of a tapir and a deer by the leader provided Teodomiro

with plenty of food, as well as a supply for our arduous trip in the Labyrinth to come. The tapir proved to be the rare high mountain form, *Tapirus roulini*. Subsequently by the offering of an enormous reward, two fresh Indians were induced to carry out the heavy skin and skull of this beast.

That night the Fire-throat (*Chalcostigma herrani*) visited us again. Like a visitor from some other world, it volplaned out of the ether and dropped onto the only flowers of the paramo—a few yellow clusters on a strange, gnarled, pear-like tree, which hung dizzily over the cliff. For one dazzling moment it hovered before me—took one sip of chilled nectar—and was gone! But that one moment of whirling tracery and iridescent fire had impacted on brain and soul a memory that would ever be challenge to feeble limbs to follow and weak brain to explain.

A most efficient reconnaissance by Lewis caused us to take the plunge into the canyons. Scanned in the calm of my home, my notes seem rather "purple" and pessimistic. At any rate they were immediately recorded and sincere impressions of a trying situation. They read: "The rains have turned the ash into a jelly-like paste. There is no trail! With heavy loads, neither ourselves nor the peons can proceed until steps are laboriously hacked into a slippery series of steps. It is all a phantasmagoria—icy streams—raging torrents—moss-covered blocks of lava, that proffer treacherous footholds—steep slopes and cliffs always facing us on opposite sides of streams—dripping clumps of paja massed to block ascents and lacerate hands that grasp—endless paramos on top of this sponge-like world—gnarled trees that block progress along knife-edges— attempts to crawl through interstices with sure knowledge that one slip will mean a plunge into the canyons on either side—and always stream after stream, torrent after torrent, and fords so numerous that definite memory will surely fail. At length we reach the Volcan!"

Here in the very depths of the Labyrinth was a narrow valley, which ascended one of the affluents of the main river of the Volcan. Before us loomed a dark narrow cleft in the mountains which gave access towards the great volcano.[1] Beyond was an

[1] On August 4, 1929, our party of three Americans, after two days on the ice-field hacked toe-holds on the steep slopes with ice axes and, with the aid of ropes, reached the ice-draped rim of the inner crater, completing the first successful ascent of this giant volcano. Plans for a new expedition to explore the Labyrinth are completed.

amphitheatre of cliffs over which dropped numerous veil-like waterfalls. Some thick shrubs, not over fifteen feet high, and a quarter of a mile in extent, had clumped themselves in the bottom of the valley along the stream, having somehow developed in the ashes since the last great eruption. As I pushed my way through the dripping branches, I caught sight of a glittering creature of gold, green and black, obviously a tanager, considerably larger than our Scarlet Tanager, and adorned with black wings and tail, its two azure wing patches and its golden breast showing brightly through the drizzle. Shy like all the birds of the Labyrinth, it flitted furtively through the tops of the shrubs. A quick shot resulted in its fall and floating feathers in the air. But so dense were the grasses and so intertangled the vines that search as we did for over a half hour, no further sign of the bird could be found. Subsequently, on our return to Culebrillas Valley, three specimens were obtained of this beautiful new species,[1] a male and two females. They were secured in the thicker growth of trees at the southeast end of the valley where the Rio Culebrillas plunges down toward the canyons of the Labyrinth. The growth here can be described as a tongue of the upper Humid Temperate reaching up towards the Paramo Zone of the main floor of the valley. But the bottom of the canyon where I secured the first specimen mentioned, although probably lower in altitude, gave no evidence of the Sub-tropical Zone, and was distinctly Humid Temperate. Probably this Tanager will be found more abundant in the denser growth of this Temperate Zone where the main canyon starts down towards the great basin of the Amazon, but I feel certain that its habitat does not extend very low. Were it common in the Humid Subtropical Zone, it surely would have been obtained before by the many expert collectors and ornithologists who have taken extensive series of many species from this zone at points not far to the south, northeast and west of the Sangay area. It seems almost certain that this Tanager, so totally distinct from all other species of the family, must be confined chiefly to the bottoms of the intricate canyon system of Sangay. The speculation that it is strictly a Humid Temperate species will suggest the cause for its isolation, for the extensive treeless area of the Paramo Zone on the

[1] *Tephrophilus wetmorei* Moore, see Auk, Jan., 1934, p. 1.

high mountains to the north and west would create an effective barrier in these directions. The vast ice-field of Sangay blocks escape to the south and an exit from the Labyrinth can be accomplished only through the Sub-tropical Zone, down the main canyon as it plunges eastward into the Amazon basin.

Other species were found in this area and exotic forms of Trochilidae, such as the snow-defying *Chalcostigma stanleyi stanleyi* (Bourc.),—the last attempting to build in a small barranca, not 500 feet below the ice-fields of Sangay, but even these doughty mites of the feathered world could not eclipse the astonishment, created by the presence of the exquisite Tanager, which for ages had defied the terrific eruptions of Sangay. In spite of decimated numbers the refugees have returned, when the fury of the great giant has ceased, and once more have made their abode in their chosen haunt at the bottom of bleak and inhospitable canyons.

California Institute of Technology,
Pasadena, Calif.

PERSONAL RECOLLECTIONS OF THE PASSENGER PIGEON.[1]

BY ETTA S. WILSON.

THE history of the Passenger Pigeon (*Ectopistes migratorius*) is well-known and the early writers have devoted much time and space to this bird whose size, beauty, utility and habits brought it before the eyes of the most unobservant. Jacques Cartier wrote about in in 1578, the Jesuit Fathers of Acadia in 1610, and many other ornithologists recorded observations down to the time of Wilson, Audubon, and the later scientists. Ranging from Florida to the British Possessions according to the season, its numbers were so incredibly vast that the belief that it never could be exterminated or even decimated seemed warranted.

But callous heartlessness, merciless cruelty and insatiable greed, combined in the habitual pursuit of this bird, resulted in its extinction not long ago. I do not intend to go into the history of the Passenger Pigeon but only to make note of those phases of the Pigeon industry in which I took an active part.

My childhood home was on the brow of a hill in Northport, Leelanau county, Michigan, a few rods west of Grand Traverse Bay. Our property had a frontage of one mile on the bay and extended westward over a series of hills paralleling the shore, and, with the exception of about twenty acres, was a heavily wooded forest of beech (*Fagus ferruginea*), maple (*Acer saccharinum*), cedar (*Thuja occidentalis*), and hemlock (*Abies canadensis*). In addition throughout the county there was a sprinkling of oak (*Quercus alba*), tamarack (*Larix americana*), pine (*Pinus strobus*), birch (*Betula lutea* and *B. papyracea*), ash (*Fraxinus americana* and *F. sambucifolia*), mountain ash (*Pyrus americana*), and on the sandy beaches juniper (*Juniperus alpina*) and a luscious purple-red fruit which we knew as sand cherries, probably *Prunus pumila*.

In those days the county was almost a wilderness and few of its many acres had felt the quiver of timber felled by the modern ax and saw. Below the hill and between our house and the bay, was

[1] Read at the Fifty-first Stated Meeting of the A. O. U., New York, November 15, 1933.

a pasture of about four acres and south of that flat land was virgin forest.

Each year the Pigeons came in late April. In that part of the state old snow often remains on the ground during the greater part of this month and the first flights were timed for arrival about the time the food supply was beginning to be visible. At first the birds fed on beech nuts lying thickly on the ground; wintergreen berries (*Gaultheria procumbens*) and partridge berries (*Mitchella repens*), evergreen plants which retain their fruit all winter; and the seeds of some conifers. Later they added June berries (*Amelanchier canadensis*), and the red elderberry (*Sambucus pubens*), actually gorging themselves upon the latter. All the fruits mentioned, with considerable coarse sand or fine gravel were found in the stomachs of the birds when dressed for the cooking pot. We found also the wild red cherries (*Prunus pennsylvanica*), chokecherries (*P. virginiana*), occasionally a few acorns, and masses of small seeds, probably weed seeds, in addition to wheat and oats garnered from the shorn fields. Invariably after a rain storm we found angle-worms with other small worms and insects. We never found any green herbage or trace of garden crops and I never heard anyone say that the birds destroyed cultivated crops of any kind although they sometimes came into our yard in late summer to eat the ripening berries of the mountain ash, a line of these trees having been transplanted to shade a footpath.

The Passenger Pigeon was a wildling and his life and activities were confined to the woodland where he found home and sustenance.

They were beautiful birds about sixteen inches long, with upperparts mainly bluish-slate and underparts rich chestnut. A brilliant iridescence covered the back and the sides of the head of the male. Females were slightly smaller, duller in color, and without the metallic sheen. The young resembled the female but their feathers were largely tipped with white.

In migration they flew in such enormous flocks that it was almost impossible to separate one group from another and at times the air was filled with a speeding host so closely banded together and flying in layers, one above the other, that the rays of the sun were intercepted and daylight was reduced to the dusk of a partial eclipse. Occasionally the upper tiers were seen flying southward.

They had evidently reached the tip of the Leelanau peninsula and finding the broad expanse of Lake Michigan before them returned to find a narrower crossing. Swift on the wing and tireless in flight additional miles did not daunt them.

Flight formation was generally a large irregular mass with a broad indented vanguard. I never saw a flock in the V-shaped formation characteristic of the flight of many species of waterfowl.

On alighting in a tree they stood erect this attitude being one of great beauty and dignity.

A "Pigeon roost" was always a nesting site and the birds roosted and bred regularly about five miles south of Northport, in a tract of timber twenty-two and a half miles long and in width from one and a half to three miles, lying between Lake Leelanau and Grand Traverse Bay. They occupied the site from their first arrival until long after the young had been raised and had flown. At this late day no correct estimate can be made of the probable number of the bird inhabitants of this place but when nesting time came there were nests in every tree from the slender sapling to the forest giant and the structures were so closely massed together that many over-weighted limbs broke and crashed to the ground with their burdens. The nests were frail affairs composed of small sticks and twigs holding one egg usually but sometimes two, and were so carelessly built that the egg would sometimes fall through to the ground. Both sexes incubated and flights to the feeding grounds in the northern part of the county were made Quaker fashion, the males flying in the early morning and the females later in the day. The old birds never fed near the roost apparently leaving the available food for the youngsters which were fat and unable to fly for several days after leaving the nest.

The great feeding flights were from daybreak to about 9 A. M., the return being made irregularly during the balance of the day when birds could be seen flying both ways, to and from the nesting place. There was always a fairly large homeward flight about sundown. The birds generally avoided trips over large bodies of water and it is probable that Leelanau County Pigeons confined their feeding flights entirely to the land during their summer stay at their breeding places.

My father, Mr. Payson Wolf (Mi-in-gun), was the champion

hunter and Pigeon shooter of the northland. He was the only descendent of a long line of great chiefs of the Ottawas, noted for their prowess as hunters and his father, Mi-in-gun, was so named because he had the courage, strength and skill to catch and strangle a live wolf with his bare hands. His mother, Kin-ne-quay, an Indian princess, daughter of the famous chief Waūk-a-zoo, was a skilled "medicine woman" of fine character, rare beauty and great fortitude. Their marriage took place when she was forty-four years old and he was twenty-two, having been arranged by the "headmen" of the tribe in the hope of perpetuating the double line of these two families. They were married in 1832 and my father was born in August of the following year. He was their only child. He married Mary, the golden-haired daughter of the white missionary, the Rev. Geo. N. Smith, of Swanton, Vt., and they became the parents of thirteen children.

In my youth I was identified with all the processes of the traffic in Pigeons, first as a retriever, then as a sorter and packer, then as one of those busy persons who plucked the birds, cleaned and cooked them, and finally ate them.

When the Pigeons arrived father went out on the brow of the hill a few yards from our door at break of day, and met the first flocks skimming over the tree tops south of the pasture, and mounting up the sharp crest of the terrace in recurrent masses. Armed with his famous muzzle-loading, double-barrelled shot gun, and always accompanied by a number of his dozen children, he took his stand at the edge of the cliff-like hill. The children carried two big clothes-baskets in which to gather the game. The first flocks usually flew a few moments apart but with advancing daylight they became an almost continuous procession and father stood there, loading and reloading, as fast as his expert fingers could manipulate the charges, and he wasted no time waiting for a good chance but fired, reloaded and fired again and again. The charge was an unmeasured handful of powder poured from his powder flask, a bunch of wadding tamped down, another unmeasured handful of bird shot, also wadded down with ramrod, hastily but expertly. He always fired both barrels into the same flock. "Bang, bang," would go the gun and the birds would rattle down around us like a double handful of gravel. I have seen an incredible number of birds drop in the

one double explosion. We frequently gathered upward of seventy Pigeons at one discharge of the gun but I have heard my mother say that she once saw him bring down 124 birds at one shot, and she was a truthful woman.

We soon filled the big clothes-basket, carried it to the house, and emptied it in the dooryard where mother and some of the older children began at once to sort the birds dressing some for immediate use; then we returned to the hill where we often found the second basket almost filled. Exchanging baskets in this way and piling the game in the dooryard enabled us to handle the birds with celerity and we built up mounds of birds and rows of mounds. No number of persons available working within the house were able to care for the birds as fast as they were brought home. Father never came to breakfast, nor did we have any, until he had bagged from 1000 to 1200 Pigeons. He had an uncanny sense of knowing about how many he had shot, although apparently paying no attention to the count. Suddenly he would say, "Come, children, let's go to breakfast, guess we've got our thousand." Pigeons were still flying over and guns were still banging all around but he knew when he had enough.

That hill was in an enclosed orchard on our premises but many hunters came to it without hindrance because it was the most favorable local site for Pigeon shooting. The well-known sound of my father's double-barreled shotgun was the tocsin which wakened the men of the village and the cry, "That's Payson's gun, the Pigeons must be coming" penetrated every home and the men swarmed up the hill and began the daily slaughter which continued from day to day without interruption until the birds, following their usual habits or perhaps worn with ceaseless attacks, no longer flew over this route in sufficient masses to warrant the long wait for them. In the small town of Northport numbering about 200 persons, practically every man and big boy came to our place to shoot and each one got some birds, but my father was the only one who brought them down by the hundred. Some of the hunters said enviously that it was the gun: "Payson's gun is a wonder," they said, but later when he sold it the weapon seemed to have lost its efficiency.

A laughable incident occurred one day. The revenue cutter

Andrew Johnson with cadets on board for a practice cruise lay in the harbor in the morning. Cadets on shore leave saw the Pigeon shooting and returning to the boat said to the officer in charge: "There's an old Indian up on the hill shooting Pigeons by the thousand." The officer said: "You may have additional shore leave. Go up to that hill and shoot enough Pigeons to feed every officer and man on this ship for a week," and his mouth watered.

So the boys returned with their carbines—to the country people "fancy shooting irons"—all cleaned and polished, marched up to our hill and took their stand with the other hunters. One of my small brothers, being greatly impressed by the shining guns and natty uniforms of the cadets said: "Now the Pigeons will suffer." Courteously permitted favorite stands by the hunters the cadets blazed away at the flocks but all they seemed to do was to make a big noise. They got few birds.

Of course the first spring flights were of old birds. As they came over the tree tops they were met by a perfect fusillade from the hunters at the top of the hill at the moment when they swept upward to clear the heights. The early flocks flew in close formation and therefore made a good mark for even the most inexperienced hunters who could not fail to bring down some birds when they fired right into the mass a few rods away and in line with their position. As the season advanced the Pigeons grew wary and came over the woods in open formation so that the combined discharge of the guns did not bring down a great many.

But when the young were strong enough to fly the slaughter began. Flying in exclusive flocks the fledglings came over the trees closely banded together and the first shots instead of scattering them threw them into a huddle where they hoped to find safety in close companionship. I have seen a flock of hundreds of inexperienced birds fly up the hill top and meeting the barrage of guns, falter, hesitate, turn and pass the entire gamut of the line thus exposing themselves twice to the attack, and return whence they came. If twenty-five individuals survived the double onslaught they were lucky.

It was amazing how low the birds flew, particularly the young ones. After leaving the forest they dipped low over the pasture, then rose sharply when they reached the foot of the hill, barely

clearing the heads of the hunters. So low were they when they reached the crest that men, boys, and even some women and girls, got quite a few by throwing clubs and stones at them. We had a big watch dog, of reputable mixed bull and shepherd descent, an efficient custodian of our premises but no hunter. When Pigeon time came he was always the first to reach the hill whining with excitement and jumping crazily around in a frenzy of expectation. I have seen him spring up into the air as a low flying flock came upward and grab a bird on the wing. In June when wounded birds fell into the deep grass of the meadow he would dash out with whoever retrieved them and show great delight over their recovery. He would locate wounded birds and kill them, but he never brought them in.

I could never kill a wounded bird. But I had to pick it up and it would look at me with its wild frightened red eyes and with one or both wings or legs broken or shot off, it struggled in my hands while its little heart beat in rapid tempo against the palms of my hands. I would take it to father who would break its neck with one expert twist of his strong hands, or one of my brothers would dispose of it in the same manner.

After the daily morning kill there was little time for tasks other than the care and dipsosal of the birds. Buyers for the Chicago market were ready to take hundreds of dozens of them, but the birds had to be sorted to eliminate those which were too badly mutilated. Of the immense number killed very few were destroyed. We tied them by the feet into bundles of one dozen each and also filled barrels with uncounted birds, the latter being sold "by the barrel." Mother always told father that when he sold by the barrel he always cheated himself in the count but his invariable response was: "I'd rather cheat myself than anyone else."

As there was no railroad in the county shipments were made by lake boat to Chicago and could be sent only on the days when the boats were due. But the Pigeon carrying trade was profitable and during the height of the season the lake passenger and packet freighters called at our port almost daily. Father always sold as many as he could and any surplus was salted down in pork barrels for winter use. Freshened over night in clear water the flesh was almost as palatable as that of the freshly killed bird.

Many Pigeons were eaten each day throughout the season. In our large family four dozen or more could be eaten in one day. The birds were not large and a husky boy could devour three at one meal. Always desiring to emulate my brothers in anything they might do, I ate three Pigeons at dinner one day but the after effects were so upsetting that they nearly robbed me of my Pigeon appetite for that summer.

Ordinarily we stewed or baked the birds, adding quite a large piece of salt pork to the old birds since they were never very fat. Mother had a big pot and into it she would pack as many birds as it would hold, cover them with cold water, add the pork cut into small pieces and sliced potatoes, season with salt and black pepper and stew for about forty-five minutes. Or she would place a similar combination in a big dripping pan and bake in the huge elevated oven, which was capacious enough to cook a meal for our big family.

Young birds were so enormously fat that we usually broiled or fried them but it was a long task to prepare enough birds in this way for so many persons. Less time was required to cook young birds, they were extremely tender, but I never ate a Pigeon of any age that was not delicate and delicious. The meat is darker than the dark meat of a chicken and is entirely without strong taste. When stewed the meat separates readily from the small bones and every part of the cooked bird may be eaten.

The task of preparing the birds for home consumption was exhausting. We spent hours plucking the feathers which came away very easily whether the Pigeons were freshly killed or had lain for some hours, saving the softer ones for the making of pillows and beds, and the further preparation for the cooking pot and salt barrel consumed additional weary hours. On the days when the boats came into port and the shipments went out father sold additional dozens to the boats' cook for use on board, receiving the standard ten cents per dozen for them when there was not an oversupply and only five cents per dozen for them when they were offered in overwhelming numbers. Sometimes he was able to dispose of a few more birds by taking his pay in what we knew as "baker' bread" to distinguish it from home made bread. A dozen Pigeons for a loaf of bread was considered a fair exchange.

Mother gave to neighbors who were not skilled hunters, or did not shoot any game, all the birds they wanted for home use without charge. A neighbor from over the way would come to the back door and say: "Oh, Mrs. Wolf, can you spare a few Pigeons?" and mother would answer: "Take all you want." And Mrs. Neighbor would stop by the piles of birds in the dooryard and go away with her arms full. No monetary value was placed on the birds which were not taken by the professional buyers; and after our needs were filled many families were supplied with feathers for pillows and beds. Pigeon feathers are soft, that is the body feathers, but have not the lasting qualities of goose or duck feathers.

While the main feeding flights were confined to the spring months, up to and including early July, there were Pigeons to be shot all summer and our table was always supplied with this nourishing meat by my brothers. Having other interests father spent little time out with the gun after provision had been made for the winter reserve.

But the Northport hunters were not the only ones who took these birds. Not only Leelanau County but all of the upper part of the lower peninsula of Michigan became a vast shooting range. Professional hunters, "Pigeoners" we named them, came from every part of the United States. Among their number was a Mr. Wrisley, of Connecticut, who made so much money catching and shipping the live birds directly to the trap shooters' clubs, where the final cruel end came to them, that he retired, and taking up his residence in Northport lived comfortably throughout the remainder of his days on his profits from the Pigeon industry. Some of his descendents still live there.

The Pigeoners came with nets and other paraphernalia with which to trap the birds in vast numbers with the minimum of time and expense. Mere shooting would probably never have exterminated a species which flew in millions and numbered billions; but it must be a super-vigorous race, abnormally reproductive, which can successfully combat systematic, wholesale attacks at all times and places including the breeding time and territory.

The roosts were scenes of horror. Father never visited them but my brothers sometimes went out with friends more out of curiosity than from any desire to take the birds. They never brought any back.

Day and night the horrible business continued. Bird lime covered everything and lay deep on the ground. Pots burning sulphur vomited their lethal fumes here and there suffocating the birds. Gnomes in the forms of men wearing old, tattered clothing, heads covered with burlap and feet encased in old shoes or rubber boots went about with sticks and clubs knocking off the birds' nests while others were chopping down trees and breaking off the over-laden limbs to gather the squabs. Pigs turned into the roost to fatten on the fallen birds added their squeals to the general clamor when stepped on or kicked out of the way, while the high, cackling notes of the terrified Pigeons, a bit husky and hesitant as though short of breath, combined into a peculiar roar, unlike any other known sound, and which could be heard at least a mile away.

Of the countless thousands of birds bruised, broken and fallen, a comparatively few could be salvaged yet wagon loads were being driven out in an almost unbroken procession, leaving the ground still covered with living, dying, dead and rotting birds. An inferno where the Pigeons had builded their Eden.

As the season advanced birds were taken in countless numbers in the harvested fields which they visited to feed on the waste grain. In these fields the Pigeoners set their nets, baited mainly with wheat although oats were also used, and at every spring of the trap hundreds were captured which were crated and sent alive to the Chicago market and to the trap-shooting clubs to be used as targets. The crates were somewhat similar to those now used in shipping poultry.

The last nesting in Leelanau County was, I believe, in 1877 and it was not large compared with former nestings. A steady decrease in the number of mating birds had been noted during several preceding years. The same site was occupied but with a diminishing area and there were fewer birds to the tree, or to the acre, or both. Flights were smaller and fear was expressed by the thoughtful that the Pigeons might be driven away. Extermination was not considered as a possibility, but it was felt that the harsh methods used to capture them might drive them to distant locations to roost and the local supply of fresh meat would not materialize.

Across the bay and to the north in Emmet County there was a much larger Pigeon roost, said to be forty-four miles long and

varying in width from three to ten miles. There the same intensive and hideous methods of snaring the birds were used with the addition of such other devices as inhuman—or human—ingenuity could invent. This site, vacated approximately in 1878, was said to have been the last nesting of the birds in their former roosts, although for many years afterward any hunter who took his gun and roamed the countryside over for many hours could generally bag a few birds. Local hunters in Leelanau County still boast, or did until recently, of Pigeons to be shot now and then and only last July (1933) while driving on a gravel highway near Northport I saw what I could almost have sworn was a Passenger Pigeon. It flew down from a beech tree by the roadside into a rut in the roadway then back again almost instantly as the car approached. Probably close inspection would have proven it to have been a Mourning Dove (*Zenaidura macroura carolinensis*).

What is the real reason why the Passenger Pigeon disappeared?

Indian lore related that the bird had been an important article of food from time immemorial. Their coming coincided almost with the end of the winter hunting season and the supply of fresh meat at that time of the year was welcome. Each hunter took as many birds as he needed to provide for his family at the time and a moderate supply to dry for a reserve against the day when famine might devastate the land. Being almost a nomadic race there was no need of carrying around a large supply of food for the woods were full of game, deer, bear, beaver, rabbit and other small animals, and the rivers and lakes were full of fish.

The Indians who live close to nature and have a knowledge of the ways of the wild that has never been mastered by the white man, used to come to my grandfather Smith, the first white settler and resident missionary in Northport, who was their teacher, preacher, lawyer, doctor and defender generally in all their troubles, and tell him that unless the Pigeons were given a chance to live undisturbed in their nesting places, that: "After awhile there will be no more Pigeons." That prophesy has come true.

My grandfather tried to convince the professional hunters that it might be well to let the birds alone one year then take them the next, thus becoming one of the early advocates of the "closed season." He also told them what several of the more intelligent Indians had said.

"Bosh" was their answer, "The Indians don't know any more about the Pigeons than we do—if as much." Then as an afterthought one added: "There'll be Pigeons as long as the world lasts." And the destruction continued.

The birds were fairly plentiful in Leelanau County in the late seventies and were also present in Emmet County at that time, but in the height of their breeding season in 1878 they were said to have left the latter roost and never returned. What became of them, where did they go?

Having no safe place upon which to rest even for a moment without the expectation of incredible cruelties, in fear and terror did they fly out over Lake Michigan and circle around distractedly until they dropped exhausted into the water?

Surely many perished in this manner, for one day in early summer we got up in the morning to find Grand Traverse Bay covered with dead Pigeons and the shore strewn with their bodies where the undulating back wash of the night had brought them in from the big lake. The night had been quiet. There had been no storm and no fog. Strong of wing summer storms never overcame them and the season of sleet storms had passed. True it had sometimes happened that small numbers of the birds had been lost in lake fogs, had flown around until their strength was spent, and had fallen and died; but there seemed to have been no possible cause for the death of so many.

Later in the day the merciful wind came up from the southwest and carried back to the bosom of the great lake the vast and silent caravan of gentle birds whose very attractiveness and usefulness had led to their extinction. Denied a foothold on the earth which was made for all creatures, without one safe spot on which they might rest, homes destroyed, their young killed, harassed and tormented on every side, had they in desperation flung themselves into the waters of oblivion?

But when the Indians saw them they said: "They have committed suicide. Their persecution was more than any living thing could endure."

9077 Clarendon Ave., Detroit, Mich.

"IS THE POOR BIRD DEMENTED?" ANOTHER CASE OF "SHADOW BOXING."

BY WM. E. RITTER AND SETH B. BENSON.

WE have a triple interest in adding another to the growing number of authenticated reports of birds' fighting their own images reflected from mirrors.

First. Thanks to the situation in which both bird and observers found themselves, we are able to present the record with unusual fullness of detail.

Second. Owing partly to recognition of the favorable opportunity for studying the case, and partly to the feeling that more effort to interpret such performances than seems to have been made, might be profitable, the observations had, in part, this end in view. A serious attempt has been made to correlate the observed activities and their almost certain motivation, in this instance, with the general structure (especially as to the brain) of birds, and with the accepted views of avian-evolution. This portion of the study has proved too elaborate and extensive to be included in this paper. It is expected to be published elsewhere. Only the concluding summary of the study is here presented. This takes the form of our answer to the question used as the main title to this paper: "No, the poor bird is not *de*-mented. It was never *mented* to meet such a situation as it found itself in here." This answer has its justification in the structure of the bird, more than anything else in the fact that the cerebral cortex (the chief seat of legislation, judgment, and guidance of action, in vertebrate animals) is exceedingly poorly developed relatively to the other parts of the brain, in the whole Avian Class.

Third. We desire to utilize the case for emphasizing the unique value of birds in a comparative study of man's status as a member of the great vertebrate division of the animal world. According to the customary view birds are so strikingly an off-side branch of the main vertebrate stem that they are of quite secondary importance for interpreting men and mammals generally, especially when the most specialized, most definitive activities are concerned.

We would point out that this extreme off-sideness of the class makes it specially useful in some respects for comparative studies as indicated. This is so from the fact that although birds and men are so extremely different in almost everything pertaining to their ordinary lives they are nevertheless both uncompromisingly true to type as vertebrates.

Subjected to thorough analysis these truths are found to contain items that seem genuinely contributory to the interpretation of human life and conduct.

But this part of the study would also be out of place in this paper. It is virtually inseparable from that listed as second, and hence must go with that in publication.

* * *

During the week previous to May 1, 1932, we had noticed Towhees (*Pipilo fuscus petulans*) on the window ledge of our adjoining studies eating seeds scattered from the cage of a captive Finch, and more seeds were placed on the ledge especially for them. We were rewarded by an increased frequency in their visits. On several occasions the birds entered the room looking for food, and once one alighted on a chair a few feet from its occupant. Interest became more acute when one of the birds began to fight with its reflection in the window-panes. On May 1 we placed a small mirror in the window to see whether or not the bird would fight its image in it. The fight continued here as there. This simple experiment led to others and to the attempt to trap and mark the Towhees coming to the window. We thought that the fighting bore some relation to the reproductive cycle and to the defense of territory, and by marking the birds we could more readily find their nests.

The trapping soon revealed that at least four birds, members of three pairs, visited the windows from time to time, but only three, two males and one female, visited habitually. Only one of the birds ever fought its reflection in the window-pane. We were able to recognize this bird at sight by an aluminum band on one leg, by its dark color, and by the worn feathers on the top of its head. We found out later that the bird had been trapped and banded on February 28, 1931, by E. S. Sumner, Sr., near the Life Sciences Building of the University of California. The other birds were

marked with colored celluloid bands and with paint so that they were easily recognizable. This individual probably was a male, for its mate had well developed brood patches during the nesting season. We found that only one member of a pair develops brood patches, and it is likely that this is the female.

The windows of our rooms in the Life Sciences Building face the south and are about twenty feet from the ground. Each is five feet wide. In front of each is a ledge a foot in depth. The window is composed of a stationary central section and two lateral casements. The window-pane forms a mirror which is most effective when it bears a film of dust and when the room behind is dark.

The Towhee, standing on the ledge, would face the window and assume a threatening attitude by lowering its head, fluffing out its feathers, and drooping its wings. It would then leap up at the window, striking it with its feet, or with the feet and the beak at a height of about ten inches. It would then fall back and immediately leap up to strike again. Sometimes it varied the procedure by continuing up the pane, clawing at its image as it rose.

The vigor and duration of the attacks varied. On some occasions the bird would be content with assuming a threatening attitude or with making two or three perfunctory blows at the pane with its feet, but at other times it would strike the pane a resounding blow with its beak at every leap and these leaps were repeated as fast as the bird could make them for periods as long as fifteen minutes. It was during these most vigorous attacks that it sometimes would continue to rise and claw at the image after striking the first blow. At the end of the most vigorous bouts the bird would be patently tired out.

That the bird was attempting to fight its image was apparent to anyone who watched the bird for any length of time. Yet the act puzzled some people when they saw it for the first time. One person came to inform us that a bird was locked out of its cage and attempting to get back into it. Another came to remonstrate from thinking we had taken its offspring which it was attempting to reach through the window. It was a visitor to one of the rooms when the bird was performing that gave us a title: "Is the poor bird demented?"

But it was the image the bird was interested in for it would

fight its reflection in mirrors or it would fight the central section of the window when the open casements offered easy access to the room.

Although the bird fought its reflection in the mirrors it appeared to prefer the dimmer image in the window-pane. The probable reason was that the mirrors used were too small to suit the Towhee's preferences as to the style of fighting. The leap upward would carry the bird over the mirror. Indeed, on several occasions the bird overshot the mirror and entered the room. After several similar attempts the bird transferred his attacks to the window pane.

An image of some sort was necessary or the bird would not fight. On one occasion the bird's access to the central section was blocked off. The lateral casement at which the bird had been fighting was shoved out at right angles to its usual position. Here it did not form a mirror for the amount of light falling on each side of the pane was the same. When the Towhee arrived it approached the pane, the while assuming a belligerent attitude. It made two or three half-hearted blows at the pane and then stood peering into it as if attempting to find its rival. Then it came around to the other side and immediately faced the pane, again with a threatening attitude. It stood peering again, but soon relaxed, turned away to eat and then moved over to the next room to fight the window there. It appeared that the bird sought an image first on one side of the pane and then the other, but finding none gave up the attempt.

The bird apparently never displayed any curiosity concerning the image. All it appeared to need was an image which would seem to fight back in a satisfactory manner. However, the bird's reaction to the image was not purely automatic. It sometimes gave the impression that it regarded the activity at the window as exercise for often it would interrupt its fighting to eat a few seeds and then return to the attack, or when more busily engaged in eating would step to the window long enough to deal it several blows and then return to eat. Also the Towhee was seen to leave the lawn where it was gathering insects for its young, fly up to the nearest window, fight the image, and then return to the task of gathering food. In the latter instance, the Towhee was not

stimulated by the sight of its image before it left the lawn, nor was it attracted by food on the window ledge for it was fed only at one window on the other side of the building. It appeared that the Towhee knew there always was a rival in the windows and would fly up to fight it from time to time.

After May 1 the bird fought the window every day until July 4. Its last visit for the summer was July 14, but it appeared again on September 23 and fought occasionally for some weeks. The amount of fighting was not constant during this period. Beginning April 28 the bird increased its fighting activity until May 15. During this period it confined its efforts to the windows of our rooms. By May 20 the attacks had fallen off a great deal and the bird had expanded the zone of its operations to include the west-facing windows of the main room of the Museum. By May 25 the attacks had nearly ceased, but after this date they increased again at our windows until on June 24 they were about as vigorous as ever. Subsequently they dwindled again to cease finally after July 14. On September 23, and for a few days subsequent to it more attacks occurred.

An explanation of the variation in the amount of activity was easy to discover. During the first period of increasing activity the fighting bird always accompanied its mate to the window. Their appearance at the window ledge was always heralded by a medley of mewing and squeaking notes from the oak tree outside the window. While the female fed busily the male would fight the window. The birds would usually fly into the oak tree where the female would sometimes preen awhile, but in a short time the female would fly to the west and disappear among the trees bordering Strawberry Creek. The male always closely accompanied the female. In a short time the male would return to the window to fight. The actions of the pair, and the presence of brood patches on the female, led to the belief that the female was incubating, but it appeared that the male was taking little if any part in the incubation other than guarding the female. Unfortunately we could not find the nest during the time available for searching for it.

After May 20 when the attacks had fallen off and when they had begun to be made on the west-facing windows, we found that the Towhees were now foraging on the lawn for insects and were mak-

ing frequent trips down to the bay trees growing beside the creek next to the grove of eucalyptus trees west of the building. The reason for the diminution was obvious. The birds were now carrying food to their young and the male did not find much time to fight.

Although we searched for the nest several times it was not found until May 31. At this time it contained only one full-fledged young nearly ready to leave the nest. This was what we had expected to find for we had thought that the period between May 1 and 15 was the incubation period and the subsequent time was the time the young were in the nest. Several days later the young one had left the nest and was not seen again.

On June 4 the birds came to the window together. Their visits and the attacks of the male at the window were similar to those which occurred during their first period of activity. On June 24 the female was captured again and the brood patches were again large and fresh appearing. This fact, together with the actions of the birds indicated that they were attempting to raise a second brood. But no nest was found. After June 24 the attacks again fell off.

The male of another pair came to the window from time to time but never fought its reflection. Its mate never came to the window to our knowledge, but once met her mate in the oak tree after he had been captured and banded. This Towhee always went toward the south after leaving the window. On May 29 this pair of Towhees was noticed foraging for insects on the lawn near the creek south from the window. Going to the place toward which they had been flying we found a nest containing three small young, apparently only a few days old.

Both the male and the female fed the young, but the male was never found brooding them. On June 28, several weeks after the young had left the nest, the male was seen feeding pieces from a crust of bread to a begging young bird. The female was not in evidence at this time.

Another male was caught twice at the window, but was not seen at any other time. Its territory probably was not close. That it was an intruder was shown by the fact that the other Towhees drove it away after both its visits.

That the Towhees tended to remain within definite territories was apparent. We could always find the birds whose nests had been found within a short distance of their nests. Our windows were equidistant from the two nests and were used by both pairs although only one pair used them at a time. That they resented the presence of other Towhees on their territories was shown by the fights which occurred when members of both pairs came near the window at once, or when a strange Towhee visited the window. The Towhee which fought its reflection was most belligerent. On several occasions he chased Hutton's Vireos and Bush-Tits that happened to come close to the nest.

The image fighting is, then, partially explained by the habits of the birds. Our observations indicate that Brown Towhees maintain definite territories in which they allow no other Towhees, that the females do all the work of incubating, during which time the male bird drives off enemies and intruders, but both males and females feed the young. It is likely that Brown Towhees, in this vicinity at least, attempt to raise two broods a season. Our pugnacious bird was perhaps one which had more belligerency than most and his great expenditure of energy at our windows was in defense of his territory against a bird which would not be driven away. The image fighting in the fall is probably likewise linked with defense of territory, for Towhees apparently hold their territory throughout the year. In this respect it is significant that hostile activities between Towhees have been noted in the late summer (Dawson, 'Birds of California,' Vol. 1, p. 407).

Being interested from previous observations and reflections in the quantitative aspect of animal activity and seeing here an exceptional chance to get data of this sort, we proceeded to take notes. With a record sheet close at hand, we could without serious interference with other employment jot down the time of arrival and of departure of the bird on his successive visits. We could also count now and then the whacks against the glass in a unit of time.

Without pretense of great accuracy such a record might be significant—especially in case the performance should be kept up for a considerable period. But some of the lacks of accuracy should be noted: Since routine work did not bring us to our rooms every day, never in the morning until about eight o'clock, and usually

did not keep both of us there much later than mid-afternoon, it is certain that many visits were not recorded.

Ordinarily the time of arrival was noted but unless the visit lasted at least a full minute the time of departure was not recorded.

Again, although the repetition of the thrusts was quite regular, especially if the bird was in real earnest, there was too much deviation from regularity to make calculation on the basis of a few counts anything more than approximations.

But despite their rough-and-ready character the data are certainly significant, especially in view of the conditions under which, and the duration of which, as previously described, the performance went on.

This record began on May 2. The last visit recorded was on July 11. How near the 70 days thus involved coincides with the breeding period of the bird the account given above duly considers.

To print this part of the record in full would seem a useless expenditure of time and energy for both writers and readers. A general summary and analysis will suffice.

Total number of visits, May 2 to July 11	116
Greatest number of visits on any one day, May 16	15
Longest single period of a visit, May 4	15 min.
Number of visits lasting one minute or more	55
Greatest number of thrusts counted in one minute	53
Least number of thrusts counted in one minute	12
Total number of visit-minutes recorded	221 (3 hr. 41 m.)

The average thrusts per minute, taking 53 as the highest and 12 as the lowest, gives 32.5. This makes a total of 7182 thrusts for the 221 recorded minutes. How many visits and thrusts should be added for the time of our absence from the rooms (many full days and some of every morning and every afternoon) there is nothing in this record on which to base an estimate.

But besides the activity at one window only, where surely much went on in our absence, three other windows were victimized sufficiently to give them considerable of the smudging that this one received. To specify 10,000 as the number of thrusts against all the windows by this one bird in 70 days is certainly to specify less than the actual number. How many he has made since, we have no other clue to than the fact that at the present writing (Oct. 2,

1933) six windows of the building are extensively marked by his operations.

Nor will it do to pass lightly over the character of the action. Almost every whack was delivered with about all the energy that could be put into it for the short distance between the foot-hold on the window ledge and the point struck on the glass. Both wings and legs-and-feet seemed to be always utilized in both making the dash and in striking the window. The actual hit against the glass was made as already stated, by feet and beak practically simultaneously. This was clearly registered in the smudging of the glass. The feet marks were confined to a zone the upper edge of which was about five inches above the window ledge. About two inches higher up came the lower edge of the zone of markings by the beak. The beak markings, much more distinct than the feet markings, sometimes contained what appeared to be bits of blood. These latter were particularly in evidence after visits in which the thrusts were specially vigorous—furious one might say. Such marks were particularly noticed on the day, May 4, when the visit lasted fifteen minutes. The time was near noon and the day particularly warm, the sunshine making it really hot at the south window where the performance was going on. The bird's fatigue was manifested particularly by his open beak as he rested a few seconds between thrusts. The thrusts during this one visit were estimated with considerable accuracy to be about 700.

It is desirable to consider briefly what is known about this same performance by other birds.

The species here concerned has quite a history in this respect although we know only one publication on the subject.[1] But this author narrates that he had seen "at least three different cases since 1911" at a cottage in Ojai, California, and other cases at his garage in Pasadena. Furthermore, he refers at some length to the experiences of an acquaintance with a case that would seem to have been as persistent as this of ours. And word-of-mouth reports of other cases by other persons have come to us. Thus in a meeting of the Cooper Ornithological Club at which our case was reported, a member gave her observations of a case that was particularly

[1] D. R. Dickey. The shadow-boxing of Pipilo. 'The Condor' Vol. XVIII., No. 3, May–June, 1916, pp. 93–99.

interesting in that it was, like ours, definitely connected with the nesting of the bird.

Nor is the performance by any means restricted to the Towhee. Mr. Dickey, for instance, mentions that two cases of it have been observed in the California Linnet, and one in the Western Mockingbird (*Mimus p. leucopterus*). From our notes the Robin (*Turdus migratorius*) and Cardinal (*Richmondena cardinalis*) are mentioned as species in which the phenomenon has been observed. A case reported by C. B. Moffat in 'The Irish Naturalist,' for 1903, of a Blackbird (*Turdus merula*) thudding against a window all forenoon, day after day, "as monotonously as clockwork," makes specially interesting reading because of what our Towhee has familiarized us with. This report of Moffat's is the more instructive from the fact that a Chaffinch (*Fringilla coelebs*) also comes into the picture. "So all through the spring of 1899," we read, "we had two battles going on. And in the third spring, the spring of 1900, it was exactly the same, the "crazy Blackbird"—as he was called—fighting himself at one side of the house, and an equally infatuated Chaffinch doing the same thing at the other."

Nor is there any doubt that many of the cursory reports that appear in the newspapers or are made verbally from personal observations have a basis of fact.

The supposition that the case we here report comes under the head of "defence of territory" the first part of this record furnishes evidence that seems conclusive. But for the benefit of readers not familiar with the subject, a few words may be said on the idea of "territory" in the bird world.

Anybody who has observed at all attentively the nesting habits of common wild birds, knows that with a few notable exceptions the nest of each pair is situated at some distance from that of any other pair and that while the breeding operations are going on the parents have a foraging ground in the vicinity of the nest, for their own food and that of their young.

It is, of course, to be expected that special students of birds would learn more about these phenomena than common observation could. Out of these specialized studies has come the idea of bird territories. Publications of the English ornithologist Howard[1]

[1] H. Eliot Howard (a) 'Territory in Bird Life,' 1920. (b) 'An Introduction to the Study of Bird Behavior,' 1929.

seem to have been among the first and most important to put the idea on a solid basis. So the conception is now taken as a secure and highly useful generalization by most, if not all, competent students of birds in the state of nature.

A rather imposing list of publications dealing, directly or indirectly, with the subject has been drawn up by T. T. McCabe of the Museum Vertebrate Zoology of the University of California. While this cannot be published here, mention of it will indicate the standing of the idea.

It may be incidentally added that in the extensive studies by one of us (Ritter) on the California Woodpecker, hardly any aspect of the life of this species comes out more strikingly than does that of its home and home area, or territory.

We quote briefly from Howard. After a few general remarks on his proposal to "use the word 'territory' in connection with the sexual life of birds," we read: "There cannot be territories without boundaries of some description; there cannot well be boundaries without disputes arising as to those boundaries; nor, one would imagine, can there be disputes without consciousness as a factor entering into the situation; and so on, until by a simple mental process we conceive of a state in bird life analagous to that which we know to be customary among ourselves. Now, although the term 'breeding territory,' when applied to the sexual life of birds, is not altogether a happy one, it is difficult to know how otherwise to give expression to the facts." And farther along: "Success in the attainment of reproduction is rightly considered to be the goal towards which many processes in nature are tending." (2 (a) p. 1).

With modification for recognizing that the concept of territory should not be quite so rigidly restricted to the sexual life of birds as here indicated, this definition should meet the requirements of any interpretative discussion of bird activities that might be undertaken. It is now certain that several species of resident birds here in California keep, and defend to some extent, their territories throughout the year and for several years.

Museum of Vertebrate Zoology
University of California,
Berkeley, California.

SEX RHYTHM IN THE RUFFED GROUSE (BONASA UMBELLUS LINN.) AND OTHER BIRDS.[1]

BY ARTHUR A. ALLEN.

Plates VIII–XI.

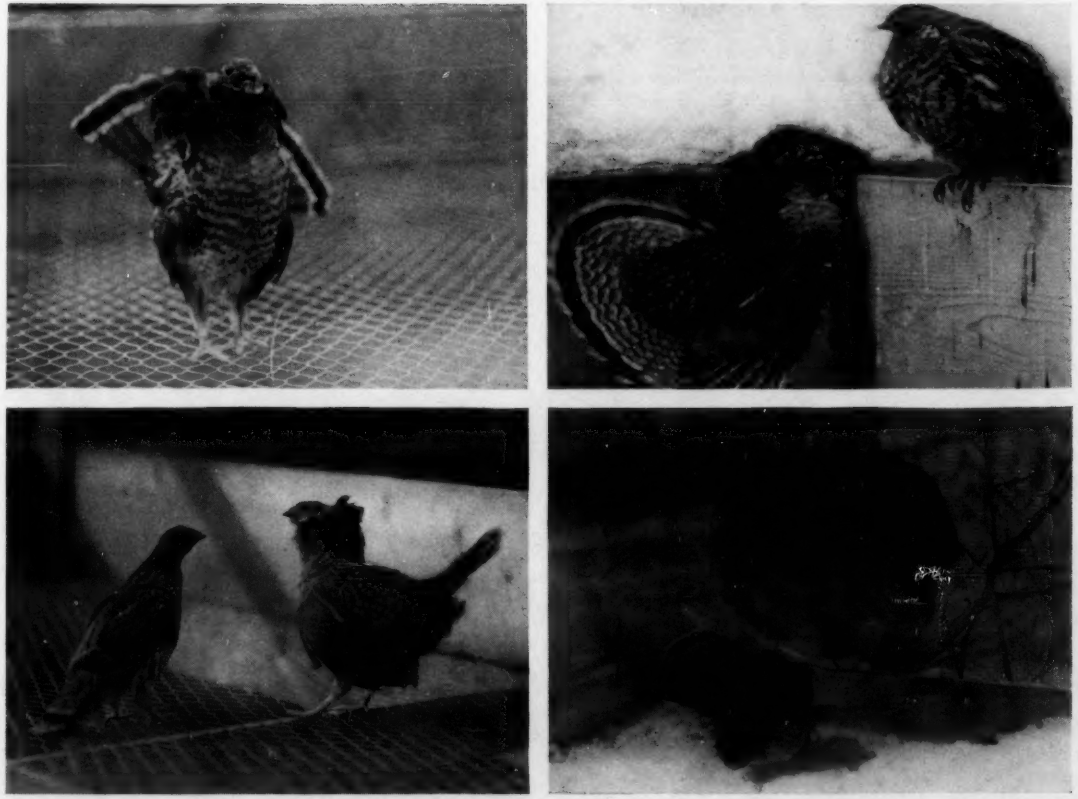
THE sex instinct is generally conceded to be the most powerful of all agencies controlling the actions of birds. It may seem heretical, therefore, to begin this paper with the statement that, after fifteen years of rather intensive study of the Ruffed Grouse,[2] I am convinced that this species, and perhaps all species of birds, are not cognizant of sex as such, even during the breeding season, and that sex reactions are based primarily upon differences in size or vigor of individuals irrespective of sex.

My observations on Grouse are based primarily upon birds reared in captivity, because these birds, being devoid of fear of man, react toward one another before one's eyes in a perfectly normal manner, and one is able to repeat and check his observations dozens of times for every single observation made on wild birds. Some of the observations have been made in large woodland enclosures, others in small pens, and, during the past three years, largely in pens with wire floors where, incidentally, the birds seem to behave exactly like others in the woods. In 1931 I reared 57 birds, in 1932, 77, and in 1933, 50, so that I have had plenty of captive birds to watch, and they have behaved quite uniformly according to the pattern which I shall attempt to describe.

In the first place it may be well to call attention to the external differences between male and female Grouse, so that it will be understood that there is no excuse for a male not recognizing a female if it were necessary to do so. Adult Eastern Ruffed Grouse vary in weight from one to nearly two pounds, averaging perhaps

[1] Read at the Fifty-first Stated Meeting of the A. O. U. New York, November 14, 1933.

[2] During these fifteen years of study of the Grouse, I have received much encouragement and direct financial assistance, firstly from the Haeckscher Fund for the encouragement of research at Cornell University; secondly from the American Game Association and, during the past three years, from the New York State Conservation Department, through its Bureau of Game.



UPPER: (A) INTIMIDATION DISPLAY OF MALE. (B) NORMAL DISPLAY OF MALE BEFORE FEMALE.
LOWER: (A) DISPLAY BEING COLLAPSED BY STRONG RIVAL MALE. (B) GROUSE THAT DISPLAYED BEFORE WOMEN AND CHILDREN BUT NOT BEFORE MEN.

twenty-four ounces, two year old birds being heavier than first year birds, and females averaging about three ounces lighter than the males. All female measurements average less, particularly the tail, which is nearly an inch shorter. If this were all, a small male might pass for a large female, because both birds wear ruffs, though these are much smaller in the females; and females show the same range of color variations as the males. A fairly conspicuous color difference, however, is that of the breast which, in the females, is pinkish brown and not crossed by the short black (or brown) feathers of the fore part of the ruff. In the males, on the other hand, the ruff is indicated across the breast, even when the long lateral feathers are retracted, as a line of much darker feathers.

The black band on the tail is never solid and continuous across the tail of the female, being interrupted or broken up on the two central feathers. The majority of males, on the other hand, have the band continuous on the middle feathers, though in at least ten per cent it resembles that of the female.

In the juvenile plumage I have discovered no certain way of determining the sex of Ruffed Grouse by the plumage, as all of the adult characters are so imperfectly and irregularly developed. The young males, however, grow faster and seem larger from at least six weeks of age. Previous to that age I have not banded my young stock and have no way of knowing definitely which develop into male and which into female birds, and many individuals seem intermediate until their adult tails and ruffs are matured at about fifteen weeks of age.

"Male" behavior commences, however, long before this age is reached. Indeed, quite frequently I have observed a vigorous young Grouse scarcely more than a week old strutting for the benefit of its companions, fighting and subjugating a weaker bird and actually going through the actions of coition. One would naturally suppose this bird to be a male, and doubtless the majority of times it is, though, as I am about to show, if a female Grouse feels itself stronger or more vigorous than a companion, it will go through what is ordinarily the behavior of a male.

Let us first consider the normal behavior of the male Grouse, in which it is ordinarily thought to be displaying its maleness:

1. *The Intimidation Display.*

The normal display of plumage, usually spoken of as the Courtship Display, is too well known to need detailed description. With ruffs elevated, tail erected and wings drooped, he walks very deliberately, occasionally pecking the ground or giving his head a rotating shake. As he approaches the object of his attention the head shaking becomes more rhythmical and more rapid and is accompanied by a hissing sound, until finally he takes a short run in front of his victim and strikes a pose to the accompaniment of a prolonged hiss. This pose he may hold for minutes at a time or he may conclude it with a rush at the other bird and an attempt to deliver blows upon its head, particularly if the bird runs from him, or in any way registers inferiority. If it fights back, the displaying bird may partially or completely collapse its feathers and withdraw, but this seldom occurs for the reason about to be stated. I have called this the "*Intimidation Display*" rather than the Courtship for, so far as I can see, it is given indiscriminately before males or females, but almost always before a smaller or weaker bird. It seems to have little to do with actual mating, except as the bird is able to prove itself stronger than its opponent, and in confinement, it occasionally results in the death of a weaker bird, either male or female.

This display may start when a bird is only seven or eight days old, and is quite frequently observed among immature birds when they have completed their juvenile plumage at about six or seven weeks of age. During the following month it is seldom seen, but from about the last of September, when the larger birds have come into their adult plumage, it can be expected at almost any time, but particularly on cloudy days. It reaches its highest development in the most vigorous males and weak or undersized birds seldom undertake it. In its completeness it is apparently confined to male birds, but females, when fighting, have a somewhat similar display, and I have on several occasions seen a *female* display in a very similar and almost as vigorous a manner as a male before a small *male* that had been completely subjugated by a larger companion and lay flat in a corner of the pen. In one case the female actually attacked the subjugated male, pecked it on the head and went through the actions of coition as a male would have done

under similar circumstances.[1] A bird that has been completely subjugated, as in this case, is subjected to attack from every other bird in the enclosure. He has developed an *inferiorism* and usually, unless removed, he remains in the corner until he dies. His resistance completely shattered, he dies, not from mechanical injury nor from starvation, but from some sort of nervous shock, and death is likely to occur within twenty-four hours. If he is removed and placed in solitary confinement, he usually recovers, but it may take weeks before he will offer resistance to other Grouse.

This *Intimidation Display* occurs not only for the benefit of less vigorous Grouse, but seems to be a reaction to a dominating complex energized by the sight of a weaker individual of any species. It is apparently what Schelderup-Ebbe[2] (1924) calls "despotism" carried to the extreme. One male bird that was kept by himself during the spring of 1932 was always inspired to the display by the sight of a woman or a child of either sex. It was impossible to get him to "show off" for the benefit of masculine visitors unless a woman or child were present, and he always selected the weakest individual for his attentions. Women in knickers or riding breeches were immediately recognized as women, especially when accompanied by a man.

With these various reactions of male and female in mind, I have come to the conclusion that the Grouse are not cognizant of sex as such, that they certainly do not distinguish between male and female, and that they have a very strong instinct for judging the relative strength of other Grouse and other creatures. With this instinct exist strong superiority and inferiority complexes, or what we may call "*superiorisms*" and "*inferiorisms*" which, when there is any competition, quickly result in what Darwin called "the Struggle for Existence and the Survival of the Fittest."

2. *The Drumming.*

The drumming of the Grouse, which I have described elsewhere,[3]

[1] Carpenter in his observations on gonadectomized Pigeons (1933), reports similar behavior with certain of his female Pigeons. C. R. Carpenter: Psychobiological studies of Social Behavior in Aves. Journal of Comparative Psychology, Vol. XVI, No. 1, Aug. 1933, p. 41.

[2] Despotism Amongst Birds by Thorlief Schelderup-Ebbe, Ph.D. Scandinavian Scientific Review, Vol. III, Nos. 3 and 4, pp. 10–82.

[3] See A. C. Bent: Life Histories of N. A. Gallinaceous Birds, pp. 142–147.

apparently takes the place of the territorial song in other birds. It is an expression by the male of his feeling of superiority. In the spring it becomes an announcement to females, and a challenge to other males. It is indulged in by adult wild birds at all seasons of the year except the molting period of July and August, but naturally reaches its height during late March and early April, at which time it is more frequent during the night than during the day. Some wild Grouse apparently lead their lives without drumming, and in captivity, as long as the females are kept with the males, they can feel their superiority without expressing it with their wings, and seldom if ever drum.

In the spring of 1932, however, I separated a two year old male from the rest of the flock and put him in a small enclosure on the ground by himself some thirty feet from the rest of the birds. The pen measured about 6 x 10 feet, and I placed a short log at one end where he could drum if he so desired. This bird had never been placed in solitary confinement before, nor had he, to the best of my knowledge, ever heard another Grouse drum, nor had he attempted to drum himself. Ten minutes after he had been placed in this new pen, however, and after a few minutes of reconnoitering, he mounted the log and almost immediately assumed the drumming pose, first patting the log with his feet as though to test the stability of the spot which he had chosen. Then followed the quick stroke of the wings, another and another, and finally the roll and a blur of wings that made the dead leaves fly from in front of the log. There was no question that he knew instinctively what a drumming log was for, and knew how the drum should be produced; but he made scarcely a sound. I stood ten feet from him, and while I could hear the rush of air and the rustle of the leaves, there was none of the characteristic thumping. Indeed it required nearly two weeks of constant practicing before the bird's drum sounded like that of a wild bird. It reminded me of a youngster trying to snap a whip—knowing just how it ought to be done and apparently doing it right and yet producing no snap. Since this bird had never seen nor heard another Grouse drum (having been hatched by a bantam and reared in a brooder), I think we are justified in concluding parenthetically that Grouse inherit an instinct to drum, just as I believe other birds inherit the instinct to sing the char-

UPPER: GROUSE THAT DRUMMED BY INSTINCT.
LOWER: TWO MALE GROUSE IN MATING CYCLE; DO NOT DISCRIMINATE BETWEEN SEXES.

acteristic song of their species, but that both need a little practice to become perfect.

I have never known of a female Grouse trying to drum, though at times I have kept solitary females through the breeding season and had them come into oestrus and lay eggs without the presence of a male.

3. *The Mating Display.*

A third reaction of the male Grouse is what I have called the *Mating Display.* This is very different from the *Intimidation Display,* both in form and purpose. The bird is no longer trying to impress others with his superiority; he is completely overpowered by his mating instinct. Instead of being vicious, he is gentle; instead of erecting his feathers, they are depressed; his tail drags on the ground and his head is held slightly upward in a beseeching attitude. He walks around slowly, occasionally shaking his head, and when he gets close to another bird he pecks lightly at the base of its bill or places his foot on its back. He seems not to recognize differences in sex and approaches other males as well as females. If the other male is in the same stage, he permits the advances and there even may be attempted coition, though the receptive male never actually assumes the posture of the female in oestrus. If the approached male is not in his "head shaking stage" he pecks the advancing bird and drives him away.

The duration of this *Mating Display* varies with different individuals and is apparently sometimes omitted entirely. It appears not to be essential to the acomplishment of coition, since one male in 1933 was known to have had successful matings following immediately upon the "*Intimidation Display.*" The *Mating Display,* however, suggests a protection for weaker or timid females, since the male in this stage is gentle and never rough with other birds.

This *Mating Display* is occasionally indulged in by a female when she comes into oestrus and has not found a mate, but ordinarily where males are available in the same enclosure, it seldom lasts long.

* * *

Let us now consider the behavior of the female.

In addition to what has been said about the plumage differences of the female, her intimidation displays, mating display and lack of drumming, there remains to mention the approach of the oestrus period and its effect on her appearance and behavior.

The enlargement of the ova and the thickening of the oviduct register externally by a filling out of the area back of the legs and the depressing of a line of feathers between the legs and the tail. This becomes quite conspicuous during the period that eggs are being laid so that egg laying females are easily recognized among their less advanced sisters.

I do not have many data on the exact time at which oestrus begins, but one female that was kept without a male became receptive, as indicated by her posturing before me when I brought her food, six days before the laying of the first egg, and this stage lasted for two weeks or until three days before the laying of the eleventh and last egg, when she began to get broody. The posture assumed by the receptive female is that of a stiffened depressed body with its wings slightly spread and the tail slightly raised.

Another indication of the approach of oestrus is the head shaking as already described, and the beginnings of nest building. This is first indicated by feeble attempts at tossing leaves over her shoulder on to her back as she sits or even as she walks. A little later she starts her nest at the base of a tree or under some brush, by excavating a little hollow and lining it with the materials within reach as she sits in the depression. The leaf throwing continues during the egg-laying period and for several days after incubation starts, so that at first she sits with her back more or less completely covered. This doubtless accounts for the differences noted in the covering of the eggs with leaves amongst wild birds. The more advanced the incubation the less likely the eggs are to be found covered, for she ceases covering her back with leaves after a few days, and there is none to fall on the eggs when she departs.

I have been unable to determine any relationship between the nest site and the drumming logs, and I have known nests with fertile eggs located in wood lots, even on the Cornell Campus, where no male could be found within half or three quarters of a mile; on the other hand, nests are sometimes found within fifty feet of a drumming log.

The male bird, in the wild, apparently never incubates, but in 1932, one of my largest red-ruffed males got broody and insisted on sitting on a nest egg for over two weeks, until I took it away from him, his behavior being exactly like that of adjacent females.

* * *

Thus far I have been speaking only of Ruffed Grouse (*Bonasa umbellus* Linn.). Before expressing again my conviction that birds are not sex conscious, or that they do not discriminate between the sexes, I should like to describe briefly a few experiences with other birds.

A few years ago when Dr. Herbert Friedmann was making his Cowbird (*Molothrus ater ater* Boddaert) studies[1] at Cornell, we kept a male bird in a flying cage on my grounds, and in an effort to make him go through his plumage display on a branch where the camera was focussed, we fastened a stuffed female just below the desired spot. The bird was rather poorly mounted but was apparently easily recognized as a Cowbird, for not only did the captive male display for its benefit, but time and again attempted coition. We thought at the time that the position in which the female was fastened might have suggested a mating posture to the male, so in 1931 I repeated the experiment with a House Wren (*Troglodytes aëdon aëdon* Vieillot), placing a mounted bird, from the museum, standard and all, on the sloping roof of a bird house occupied by a pair of House Wrens. The slope to the roof gave the mounted bird an almost vertical position. Nevertheless the male responded immediately, flew at the brazen visitor, pecked it on the head, and again and again attempted to mate with it.

Still another experience with Canada Geese (*Branta canadensis canadensis* Linn.) in captivity. For years I kept two females which behaved exactly like a mated pair, except for one year when a gander mated with one and drove away the other. They travelled together continuously and seemed very much attached to one another. During March or early April, one of them would build a nest and lay four or five eggs, while the other stood guard like a gander. After about a week this bird would build a nest alongside of her mate and lay four or five eggs. Then they would sit side by side and spend their time stealing each other's eggs until they all

[1] The Cowbirds. A study in the Biology of Social Parasitism. 1929.

got broken. It was obvious that the slightly larger female was behaving like a male until her actual nest building and egg-laying began.

Another experience was during the spring of 1932, with a Yellow Warbler (*Dendroica aestiva aestiva* Gmelin) that came to a Spiræa bush near my study window. He was happy until he espied his reflection in the window, and assuming it to be another Warbler intruding in his territory, he flew at the window to drive it away. To determine conclusively that it was his reflection that caused him to fly against the window, I hung a mirror alongside the window to make it more worth his while. He immediately transferred his attention to it, behaving like the monkey in the zoo, looking at his reflection from all angles, singing, flying at the glass in a rage, and peering around behind it as though expecting to find his rival in the bush behind the mirror. He continued this for about three days, until his newly arrived mate had about completed a nest in an adjacent pear tree, when his ardor cooled.

* * *

What is the relevance of these disjointed observations and their connection with the behavior of the Grouse? They all are, in my belief, expressions of the same blind instinct which recognizes so quickly and yet without reason, differences in strength or vigor; and the natural law among lowly-organized creatures, that the strong shall destroy the weak, a law which seems to me more powerful than the actual mating instinct itself, and which is not cognizant of any sex difference as such.

The male Yellow Warbler that selects a territory instinctively drives out all other Yellow Warblers, males and females (and reflections) from his territory, so that when a female arrives that is in the same stage of the reproductive cycle as himself, he will be the only male around when she comes into the oestrus period.

In a flock of Ruffed Grouse, birds that are equally vigorous are apparently oblivious to one another, but let one make a single misstep, fly into the wire, or misjudge his landing place so that he alights somewhat confused, immediately any other Grouse near by takes a peck at him, and unless he fights back and is able to disprove his weakness, he or she is immediately relegated to the inferiority class. A flock of apparently timid, gentle Grouse becomes a

"pack of wolves," and the reaction is entirely devoid of sex relationship. A male Grouse drums and displays to show his superiority, and until he actually comes into the final mating stage of his display, he is as much interested in killing a female as in mating with her or disabling a rival. If he is able to prove his superiority—and a female is strong enough to resist or elude his attacks until they are both in the same mating cycle—fertilization takes place and the world is assured of the reproduction of the strongest individuals. The Survival of the Fittest still seems to be the strongest law of Nature.

Howard in his illuminating book on Bird Behavior[1] (p. 74) states "A bird is like a mammal. Throughout the cycle the male is physiologically prepared to conjugate, but the female is under stricter physiological control; her prior sex condition corresponds to prooestrum, and her condition when the secondary physiological control is removed to oestrus." He describes the actions of a pair of Hedge Sparrows and their inability to produce fertile eggs in spite of being together from February 21 to April 10, and explains it on a basis of lack of intensity of reaction in spite of all the posturing and sexual flights that took place. Lack of sufficient stimulation in this and other birds he ascribes to variations in the weather, food, metabolism and unknown factors.

My explanation would be somewhat simpler. It is my belief that birds are *not* like mammals and that the males are *similar* to the females in having a short definite mating period.[2] The period may be longer than that of the female or it may be shorter; it varies with species and with individuals, especially with age. In domestic poultry the period is either very long or it recurs at such frequent intervals that it confuses our conception of its status in wild birds. The male comes into and passes out of a definite mating cycle irrespective of the presence of a female and any posturing or sexual flights. The whole framework of bird behavior during the breeding season is built around securing *synchronization* of the cycles in male and female. The selection of territory, display

[1] Howard, H. Eliot; An Introduction to the Study of Bird Behavior, 1929.

[2] Note in this connection the work of Prof. Thomas Hume Bissonnette with Starlings, 1930. Studies on the Sexual Cycle in Birds. I. Sexual maturity, its modification and possible control in the European Starling. Am. Jour. Anat., Vol. 45, pp. 289–305.

—intimidation— driving away of other males (and females early in the season) is an effort not only to provide an area in which the young can be reared without competition for food, but primarily to insure the acquisition of a female in approximately the same reproductive cycle as himself, so that their mating periods will synchronize. If he is not successful in keeping other males away, the female which has settled in his territory—when she comes into oestrus is just as likely to mate with some other male as with him. On the other hand, if he permitted the first female that arrived to settle in his territory, he might well get one with which his mating period would not synchronize. Hence the intimidation displays—sexual flights, etc., to determine whether the two birds are approximately balanced before either one comes into the mating cycle. Hence the strong instinct to "dominate" as previously described. Birds in the same reproductive stage are rather evenly balanced and neither one can dominate the other, irrespective of sex. The condition of the reproductive glands is very easily influenced by the metabolism of the bird and by any sense of inferiority. A bird that has developed an *inferiorism* from having been dominated by another may never come into the mating cycle.

Hence, when the male selects his territory, he drives away all others of his kind, male or female, that are not as far advanced in the reproductive cycle as he himself. Finally a female arrives which is in the same rhythm as himself. He drives her out but she immediately returns.—When she stands her ground, he leaves her alone and feeds beside her; when she runs or flies from him, he pursues her, and the "Sexual Flights" described by Howard develop.

If the species is rare, territories large, competition not severe—a lack of synchronized rhythm and resulting infertile eggs is likely to occur. The more common the species, and therefore the greater the competition and the smaller the territories, the greater is the likelihood of absolute synchronism.

Final extirpation of species on the verge of extinction, such as the Heath Hen and the Passenger Pigeon, I believe might well have been accomplished because of a lack of synchronization in the mating cycles of the few males and females left toward the end of their existence, and we can look for the same thing in the Trumpeter Swan, Whooping Crane and Ivory-billed Woodpecker. Failure to

synchronize the mating rhythm may likewise be an important factor in delimiting breeding ranges of species, those few birds at the edge of the breeding range being less likely to produce fertile eggs. The high percentage of infertile eggs among captive birds of all species, where forced matings are necessary on account of the few individuals available, is explainable on this same basis rather than on any inherent weakness of the males. The failure to establish foreign species when few individuals are liberated or the stock widely scattered is likewise explainable on these grounds.

Furthermore, the changing of mates between broods reported by Baldwin[1] and Nice[2] may well be accounted for by the short mating period in the male and the necessity for synchronization with that of the female.

The Hedge Sparrows of Howard that produced infertile eggs after associating for nearly two months were doubtless out of tune. The male may well have passed through his mating cycle before the female came into oestrus.

* * *

The test of a theory is its practical application, and fortunately I was able to test mine on my Ruffed Grouse during the spring of 1933, with rather satisfying results. In the past the fertility of Grouse eggs has averaged about 70% in captivity—in the wild state over 90%. If my theory were correct, I had merely to synchronize the periods of males and females perfectly in order to insure higher fertility. Furthermore, if males are not sex conscious and depend upon their dominating instinct to insure proper mates for themselves, one should be able to bring them into their mating cycle while isolated and determine when they are ready to mate by offering them a stuffed bird as I had done previously with the Cowbird and the House Wren.

Accordingly on March 27 when my male Grouse, which had been kept together all winter, began to fight more actively in an effort to dominate one another, I placed the six worst offenders in separate pens. Some were displaying at this time and some not, but practically all started to display as soon as the restraining influence of

[1] Baldwin, S. P. The Marriage Relations of the House Wrens. Auk 38, pp. 232–244.

[2] Nice, M. M. Do Birds Usually Change Mates for the Second Brood? Bird-Banding 1, pp. 70–72.

stronger birds was removed. Now if this characteristic display of plumage was an evidence of reproductive maturity and if, as Howard states, the males are ready to conjugate throughout the cycle, each displaying male should have been ready to mate with any female that came into oestrus. This, however, was not the case. On April 12, the first one year old female came into oestrus, as evidenced by her following me about the enclosure and crouching in characteristic pose whenever I reached toward her. This bird was submitted to successive males. Three were disinterested, two wanted to fight and subdue her, but showed no desire to conjugate, and only one attempted coition. This reaction was exactly as I had anticipated, because I had previously offered to each male a stuffed Grouse mounted in the oestrus pose.

I soon learned that it was as simple to determine when a male Grouse had come into his mating cycle as to observe when a female came into oestrus. One had merely to place in his cage each morning a stuffed Grouse or a Grouse skin or a dead Grouse—the exact pose was unimportant so long as it was more or less flattened, or at least not mounted in an attitude of display, and the sex of the stuffed bird was equally unimportant. Depending upon the cycle in which the male happened to be, he would pay no attention to the proffered bird; he would fight it—pecking it on the head and pulling out feathers; or he would attempt to mate with it.

It would be expected from Howard's statement that once a male Grouse had become sexually mature, he would remain so throughout the breeding season. On the contrary, with the males experimented with in 1933, the number of days that each bird was ready to mate varied considerably, but in no case was greater than two weeks. Some males were ready for only two days, and then reacted negatively for from a week to ten days before being ready once more for a few days. Some never came back into the mating cycle and some birds, including the largest, heaviest, and best looking bird I had, never arrived at the mating stage during the entire season.

Now for the practical application of the theory—an attempt to increase the percentage of fertile eggs laid by the captive Grouse. The females were divided into five groups, as follows:

(1) Six second generation females one year old.

UPPER: (A) NORMAL FEMALES IN PRE-LAYING CONDITION. (B) A LAYING FEMALE WITH ABDOMINAL FEATHERS DEPRESSED.

LOWER: (A) FEMALE IN OESTRUS POSTURE. (B) REACTION OF MALE DURING MATING CYCLE TO STUFFED MALE.

(2) One second generation and five first generation females—one year old—these birds inferior in appearance to group (1).

(3) Two first generation females one year old in a pen by themselves.

(4) Ten first generation females one year old.

(5) Eighteen first generation females two years old.

In pens 1 and 2—no male was given until he had been tested and found ready to mate. He was then placed with the females and watched to see if he were acceptable. The females would immediately try to dominate him as they would any strange bird placed in the flock. If the male was not strong enough to subdue the fighting females (those which had not yet come into oestrus) he had to be replaced by another immediately, lest he be killed by them. If he were strong enough to subdue the females that wanted to fight, he was left for as many days as he gave the proper mating reaction to the stuffed bird when it was placed in the cage each morning. When he was apparently no longer interested he was replaced by another good male, and returned to solitary confinement until he should again come into the mating cycle and be ready to mate with the stuffed bird. This was sometimes a week later, at other times never.

I had learned from experiment that a male would mate with a stuffed bird at least four different times during the day; and whether this was always necessary or not, at least there was a male in readiness for conjugation whenever a female should come into oestrus. How successful the experiment was can be judged by the fact that in pen No. 1, 96% of the eggs were fertile, in pen No. 2, 92%.

In the third pen with two females, one of the females never came into oestrus nor laid an egg, and the one male introduced on April 7 was left throughout the season and apparently synchronized satisfactorily for 12 out of 13 of the eggs were fertile, or 92%.

In pen No. 4 with ten yearling females, males were introduced, one after another, as they came into the mating cycle, until there were five in the large 8 x 36 foot enclosure with the females. This method was unsuccessful because not only did the females raise initial objection to each new male, but the males, previously introduced, raised even more strenuous objection and so much fighting

ensued that it apparently upset all of the birds, both male and female, and very few eggs resulted, and the fertility was but 82%.

In the fifth pen which might be considered the "check," 18 females and nine males (two years old) were kept together all winter and not disturbed during the mating season. A certain amount of fighting naturally ensued, but the birds were rather evenly balanced and serious fights were usually interrupted by other birds. One would naturally expect that with so many males present that at least one would always be in the mating cycle and ready to conjugate whenever a female came into oestrus, but the fact remains that while egg production was better than in pen No. 4, only 70% of the eggs were fertile.

The conclusions from these experiments are the following:

1. The female has an oestrus period when she is ready to mate which lasts from less than a week before the laying of the first egg to about three days before the laying of the last one.

2. When not actually in oestrus, a female is oblivious to sex and attempts to dominate weaker birds just as does a male.

3. Male birds have quite as definite mating cycles as females which last varying periods of from two days to two weeks—possibly longer.

Previous to this period and throughout the period, the males are oblivious to sex differences and do not differentiate between males and females even in mating. At all times they are very sensitive to differences in physical strength and apparently also to *superiorisms* and *inferiorisms* in other birds. Variations in metabolism and in the degree of domination by other birds apparently radically effect the rate of development of the gonads and the time at which the male comes into his mating cycle; possibly also the duration of the cycle.

4. In order to produce fertile eggs there must be absolute synchronization of the two mating cycles, one fertilization perhaps lasting for as many as three eggs.

* * *

Now to apply our observations on Grouse to other birds:

If it is true that birds in general are oblivious to sex differences and that when the male is in his mating cycle he will mate with any bird of his species (and sometimes with other species) that dares to

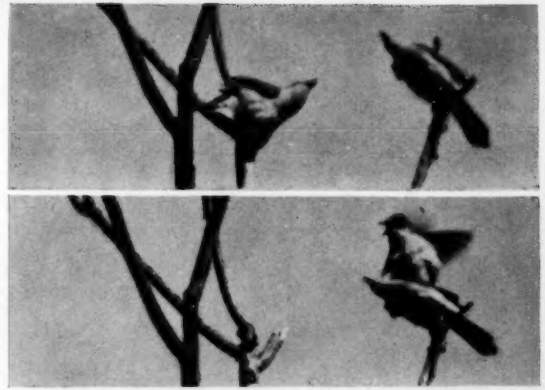
remain in his territory, then perhaps a mounted bird placed in his territory will be just as acceptable as a receptive female because, of necessity, it must remain immovable and not try to escape. Since the mating cycle is short, however, one can expect quite different reactions on succeeding days accordingly as the placing of the mounted bird synchronizes or not with the mating cycle of the bird experimented with. I have already related my experience with the Cowbird, the Yellow Warbler and the House Wren. In 1933 I experimented with a Song Sparrow (*Melospiza melodia melodia*, Wilson) and a Yellow-breasted Chat (*Icteria virens virens*, Linn.). The experience with the Chat was short and while suggestive, was not altogether conclusive, as I could not follow it through to its natural conclusion. On June 6 I placed a blind at the edge of some shrubbery in a Chat's territory, and erected a dead branch in front of it to which I could fasten a mounted Chat. The only specimen I had for use was the flat skin of a male bird, but I blackened the white cotton eye with my fountain pen and ran a wire into the body of the skin so that I could fasten it to the branch in a semi-natural condition. I entered the blind—gave a few whistles in imitation of a Chat and proceeded to await the arrival of the owner of the territory which had been heard calling when I first came with my blind, but which had been quiet during the operation of setting it up. I had not long to wait. Like a flash of gold he shot from the shrubbery to the prepared branch with his throat puffed out as large as a pigeon's egg and full of clucks and whistles. Wings down, and tail up, he landed on the branch below the skin, and twisting and turning and peering he climbed the branch in characteristic clownish manner. Nor did he waste much time in preliminaries. When the stuffed bird did not fly away or fight back, his one reaction, in the particular cycle in which he apparently was on this day, was to mate with it. There was left little to the imagination, and three different times he advanced to the skin in characteristic manner, mounted it and attempted coition. The third time, owing to the insecurity of the wire holding it, the skin pitched head foremost to the sedges below, where he followed it and attempted once more to mate with it. Having used up my motion picture film and wishing to return the next day for some close-ups of the singing bird, I frightened him away—took the skin and camera with me but left

the blind and branch. The next morning when I returned a change had apparently come over the male Chat. He was not calling when I arrived and answered me rather feebly when I whistled. However, I made the same set-up as the day before and attempted to call him to his stuffed mistress. This time, however, he was disinterested. Eventually he came to the branch and looked over the intruding bird but with none of the concentration of the day before, so that the rattle of the camera frightened him away and he did not come back. My assumption is that his behavior paralleled that of my male Grouse which pass abruptly out of the mating cycle, so that while they may be ready to mate with a stuffed bird one day, the next day they register no interest. Owing to other duties I was unable to proceed further with this experiment.

Later in the summer I became interested in two male Song Sparrows (*Melospiza melodia melodia*, Wilson), which had settled in my garden earlier in the season. Each had a female with eggs in bushes about fifty feet apart and on opposite sides of the driveway, which was apparently a boundary to their territories, and where considerable fighting had taken place earlier. On July 8 one of the most severe hail storms I have ever experienced destroyed both nests and the female birds disappeared. What became of them I do not know—nor apparently did the male Song Sparrows, for almost immediately their song, which had almost ceased, was resumed with springtime fervor, and once again they began fighting in the road and flying at one another whenever the boundary was crossed. The birds seemed evenly balanced and each was supreme in his own territory.

It occurred to me that this might be a good opportunity to repeat the Chat experiment. Accordingly I arranged a perch over the deserted nest of one of the birds, on which I fastened a mounted Song Sparrow as in the case of the Chat. I was not able to imitate the Song Sparrow's song, so I merely got into the blind and awaited developments. Soon the male bird in going the rounds of his territory espied the Song Sparrow's skin and swooped down at it in characteristic fashion.[1] It did not fly from him and it did not fight back. According to my theory, if he were in the mating cycle,

[1] See Relations Between the Sexes in Song Sparrows by Margaret Morse Nice, Wilson Bulletin XLV, June 1933, pp. 51–59.



UPPER: (A) REACTION OF MALE CHAT TO A STUFFED BIRD IN HIS TERRITORY. (B) MALE YELLOW WARBLER THAT FOUGHT AND SANG TO HIS REFLECTION.

LOWER: (A) FEMALE CANADA GOOSE THAT BEHAVED LIKE A GANDER BUT LATER BUILT A NEST. (B) MALE COWBIRD'S REACTION TO A STUFFED FEMALE DURING MATING CYCLE.

he should attempt to mate with it, but this he did not do. He sang rather feebly a couple of times, picked at the label on its leg and departed in the direction of the other Song Sparrow that was now singing. Apparently he was not in the mating cycle or else he was more intelligent than the Chat and recognized a dead bird when he saw it.

To determine which, I captured the other Sparrow at a feeding station and placed it in a small cage (4 x 4 x 12 inches) above the deserted nest. Unfortunately it was necessary to introduce a second factor at the same time, for not only was this captive bird alive but it was able to attempt either to fight back or try to escape, and either reaction would produce a different result in the attacking bird. The reaction of the caged bird, however, was quite unexpected, for though it had accepted its confinement and was not apparently very much afraid of me, when its rival appeared on the scene and tried to reach it through the wire, it was thrown into a paroxysm of fear. I have never seen more conclusive evidence of the power of "domination" of one bird over another. The bird in the cage was perfectly safe from the attack of the other as long as it remained in the middle or on the opposite side of the cage. But the bird on the outside strove frantically to get at it and the bird on the inside fluttered just as strenuously to keep out of reach. After a few minutes both birds were panting as they often had before when they rolled over and over in the drive. This time, however, the caged bird was obviously terrified and made no effort to fight back, and when by chance the aggressor got hold of one of its primaries and held on—the poor thing quivered and expired from the shock. The fight had been of no more duration than many I had watched in the drive, and there had been no mechanical injury to either bird, so that fear and shock alone must have caused the death of the bird in the cage.

This might never happen in a state of nature, but it gives evidence of the sensitiveness of the bird's organization to the dominating influence of others of its kind, and the value, therefore, of intimidation displays, on the part of the male birds in driving away rivals. Carrying the thought still further, the action of natural selection in developing the ornamental or conspicuous plumes, or bright colors or loud songs of male birds may have as its activating

principle—this fear of the rival which was apparently so real to the little caged Song Sparrow as to cause its death; that fear which, in the case of my Grouse, gives them an inferiorism from which they often never recover sufficiently to come into the mating cycle during the entire season. It is difficult sometimes to understand how little differences in color or song can have much survival value, but if their presence indicates greater strength to rival males and therefore helps to produce fear or an inferiorism, then their value cannot be measured by their slightness. They have real value in the eyes or ears of rival males and therefore real significance in the action of natural selection.

Well, what of the victorious little Song Sparrow? Was he exhausted by the experience? Apparently not at all. He mounted to the telephone wire and sang and sang, and eventually a female arrived and built a nest in a neighboring bush and laid four eggs. It was now, however, the first of August, and whether or not he had been in the mating cycle—weeks earlier when he refused to mate with the stuffed bird but killed his rival—he was so no longer, for the eggs never hatched and upon examination proved to be infertile.

* * *

In conclusion let me lay before you for your consideration, further observation, and experiment the following outline of bird behavior during the breeding season which has been forced upon me during the past few years as the culmination of my study of the Ruffed Grouse and the application of my observations on Grouse to other birds:

* * *

1. Birds are not sex conscious, that is, they do not discriminate between the sexes as such.

2. Courtship displays, including song, are one form of intimidation and the stronger bird, irrespective of sex, is the more active performer.

3. Domination and fear are the important principles in the development of secondary sexual characters and even in controlling the mating cycle.

4. Female birds have a short oestrus period during which fertilization must take place. It begins a few days before the laying of the first egg.

5. Male birds have a similar short mating period during which they are able to fertilize eggs.

6. Bird behavior, including the earlier arrival of males than of females on the nesting ground, and of adults than first year birds; selection of territory, song, fighting, and display of plumage are explainable on the basis of the necessity for synchronizing the mating cycles of male and female.

7. In order to insure the propagation of the strongest birds, the virile male must keep all the other males out of his territory and must drive out all females that are not in the same reproductive cycle as himself lest another male mate with his female, or lest he waste his energy on a female that does not synchronize with him.

8. The stage of the reproductive cycle each spring is determined primarily by the vigor of the bird which depends first on *metabolism* of the individual influenced by a great many factors such as age, food, temperature, sunlight, parasites, etc., and secondly by the *mental state* of the individual, and this is determined largely by the results of his conflicts with others of his kind. An inferiorism resulting from a disastrous conflict may keep a bird from arriving at a mating period, while successful conflicts stimulate the development of the gonads which, with most birds, are not fully functional at the time of arrival on the nesting ground.

Cornell University, Ithaca, N. Y.

THOMAS ANBUREY'S OBSERVATIONS ON NORTH AMERICAN BIRDS.

BY HERBERT FRIEDMANN.[1]

ONE of the rarest and least known of the early books of travel in North America is the "Travels through the Interior Parts of America in a Series of Letters," by an Officer, published in London in two volumes in 1789. The officer in question was Thomas Anburey, who served in the British Army in America during the Revolutionary War under the Earl of Harrington, "colonel of the twenty ninth regiment of foot." This work is apparently unknown to most ornithologists as it does not appear in any of the ornithological bibliographies or indices to literature. It was brought to my attention by Mr. Austin H. Clark.

Among a great variety of topics discussed in the letters are a number of readily identifiable birds, and some of these accounts are surprisingly full. Because of their historical as well as naturalistic interest, they are here quoted verbatim, and are arranged in chronological order, according to the dates of the individual letters.

In letter number 8 (written at Quebec, November 4, 1776 (volume 1, page 83) he writes that in the woods of that part of Canada " * * * ; we found likewise vast quantities of partridges, much larger than ours, which the Canadians call pheasants; there are two sorts of them, the spruce and the pine: the meat of the former is very delicious, to those who are fond of the flavor of the spruce."

Letter 26 (volume 1, pp. 275–277) written at Camp at River Bouquet on Lake Champlain, June 23, 1777, contains some interesting notes on the Passenger Pigeon. For completeness sake I have included it here, although it has been quoted in part by A. H. Wright (Auk, 1911, p. 364) who seems to be the only ornithologist to have known of Anburey's book.

"There are at this season of the year prodigious flights of pigeons crossing the lake, of a most beautiful plumage, and in astonishing quantities.

"These are most excellent eating, and that you may form some idea as to their number, at one of our encampments, the men for

[1] Published by Permission of the Secretary of the Smithsonian Institution.

one day wholly subsisted on them; fatigued with their flight in crossing the lake, they alight upon the first branch they can reach to, many are so weary as to drop in the water, and are easily caught; those that alight upon a bough being unable to fly again, the soldiers knock down with long poles.

"During the flights of these pigeons, which cross this lake into Canada, and are continually flying about in large flocks, the Canadians find great amusement in shooting them, which they do after a very singular manner: in the day time they go into the woods, and make ladders by the side of the tall pines, which the pigeons roost on, and when it is dark they creep softly under and fire up this ladder, killing them in gerat abundance; they then strike a light, and firing a knot of the pitch pine, pick up those they have killed, and the wounded ones that are unable to fly. During the flights of these pigeons, which generally last three weeks or a month, the lower sort of Canadians mostly subsist on them.

"Now I am upon this subject, it reminds me of what *Monsieur Blondeaux* was continually telling me of, *le grand plaisir que j'aurai quand l'ete commencera en tuant les tourtes;* adding, at same time, with great pleasure, *amusement que le Canadien aime beaucoup.* However, as to the numbers he used always to join with this observation, I generally thought my good landlord was setting off his country to great advantage by dealing in the marvellous, and should have been impressed with that idea, had I not been by ocular demonstration convinced to the contrary."

In letter 54 (volume 2, pages 198–208) written at Mystic, in New England (Connecticut) May 10, 1778, he describes four birds, the Fire-bird (Scarlet Tanager?), the Hanging-bird (Baltimore Oriole), the Blue-bird, and the Humming-bird.

"The Fire-bird is somewhat larger than a sparrow, and its plumage is of a fine deep yellow, resembling a flame color, from whence it derives its name.

"The Hanging-bird is of about the same size, of a brilliant orange, with a few black feathers in the wing, which forms a pleasing contrast: It appears as if this bird was sensible what enemies men, as well as other animals, are to the young of the feathered creation, for they construct their nests upon the extremity of a large bough, not in the nature of other birds, but sus-

pended at a considerable distance from the bough, resembling a hornet's nest; on one side there is a hole where the birds enter. It is somewhat remarkable that these nests, though suspended near two feet and a half from the branch of the tree, and that only by five or six small cords which these birds make from the loose hemp that they pick up, they are never blown down by the high winds. I was present at the taking of one of these nests, and it was with great difficulty it could be disengaged from the branch, without destroying the whole nest. The young ones are the most tractable of the feathered tribe, and in the hands of those who would bestow time and pains, they might be instructed in a variety of little tricks and fancies.

"An officer, who was ill and confined to his room, being a great bird-fancier, had a nest with these young ones brought him, which he amused himself with, and finding them tractable, he fed them with flies, for which they would follow him all round the room: in a short time he had them in such command, that they would at his desire, retire to their nest, and come out again either singly, or all three together: one he had such sway over, that he would take it into the garden, and let it fly into a tree, and the instant he called it, the bird flew and perched on his shoulder.

"The Blue-bird is of the size, and nearly as numerous as the sparrow; there is nothing remarkable about this bird but its plumage, which is of the most beautiful mazarine, and when the rays of the Sun reflect on it, the color is greatly heightened.

"The Humming-birds are in great plenty here, but not near so numerous, as I am informed they are to the Southward.—This bird being not only beautiful, but having many peculiarities, and being the least of the feathered creation, not being much larger than an humble bee, you'll pardon my entering into a full detail of it.

"The plumage of the cock is beautiful in the extreme, varying into an infinity of colour; in one light it is of a lively green, in another a beautiful blue, and in another a fine golden color: in short, in every ray of light you can possibly turn it, you distinguish a different tint. This little creature subsists upon the juice of flowers, which it sucks up with a long bill; it is really diverting to see it putting its little bill into every flower in a circle; as soon as one is sucked, it flutters to the next; during the sucking the juice out

of the flowers it never settles on them, but flutters continually like bees, and moves its wings so quick they appear hardly visible, and during this fluttering make a humming noise. This bird is not very shy, but if you attempt to seize it, flies off with the swiftness of an arrow. You would hardly conceive how predominant the passion of envy is amongst these little creatures; if several of them met on the same bed of flowers, they attack each other with their bills. In their combats they would often fly into a room if a window is open, fight a little, and flutter away again; they not only possess the passion of envy, but anger; for if they meet with a flower that is withered, or that is withering, and contains no more juice, these little creatures, in a violent passion, pluck it off and throw it on the ground. I have seen in large gardens, where there has been many beds of flowers, the ground quite covered with the effects of their rage.

"The Humming-bird being so exceeding small, and very difficult to catch, I was greatly at a loss to procure one to stuff and add to the collection I am making for you; sensible that firing at it with shot would shatter the little creature to atoms, I knew not what method to devise to obtain one, therefore consulted the inhabitants, who informed me, they never caught them unless they flew into a room when the window was open; for a week and upwards I sat in expectation that that would happen, during which time I employed my thoughts as to some other mode, when it occurred to me, if I loaded a pistol with powder, and put some fine sand as a charge, I thought the great report would either stun them, or the grains of sand would beat them down: and after my patience was quite exhausted as to the other mode of catching them, I adopted my own, which I found succeeded to my wish; for seeing one alight upon a flower, I fired at it, and it fell with the report; as shortly after I had taken it up, it was near escaping; what makes me imagine it was only stunned was, that the grains of sand had not hurt even its feathers; but to ascertain the matter, I procured several only by putting powder in the pistol, which fully proved it was the report that had effect on them.

"It is looked upon as a great rarity indeed, if the nest of this little bird is found, and it is merely accidental, as they are only to be met with in swamps, when the trees are very thick of foliage.

Having procured the bird, I was anxious to obtain a nest, as I no doubt imagined that it was equally as curious as the bird itself, but well knowing any search that I could make would be in vain, I told several Negroes, who were cutting wood in a swamp, if they found a nest and shewed it me I would give them a dollar; accordingly, one morning a negro came and informed me he had found one; I went with him into the middle of a large swamp, and stopping just by where he had been cutting some wood, he says, 'Massa, Massa, dere is de nest,' which not being very easily discerned, he got a long pole and pointed to it, when even then I could not see it, perceiving nothing but moss; but taking away his pole hastily, he said, 'Massa, keep your eye dere, and you will see de old one'; and shortly after the old one came and settled on the nest, between the forks of a bough; I ascended the tree, and was then as much at a loss to find it till the negro pointed to it, and I saw the old one on the nest: upon my approach she flew off, and kept hovering and humming about my head. In the nest there were two eggs; I cut off the branch the nest was on, and descended the tree, but coming down the main stem, I had the misfortune to drop one of the eggs out of the nest, as I was obliged to bring the branch it was on in my mouth, and although the negro and myself searched for it near an hour, we could not find it; I cannot but say I was heartily vexed, as the eggs are the greatest curiosity: it is rather fortunate I have one left to send you, otherwise you would scarcely credit it, when I tell you, that although the bird, which, as I before mentioned, is not much larger than an humble bee, the eggs are nearly as large as a wren's.

"Upon an examination of the nest, I was not surprized at my discerning it with difficulty from the other moss that grew on the tree, for the outside has a coating of green moss, such as is commonly on old pales, enclosures, and old trees; the nest, as well as the bird, is the least of all others; that which I have taken is round, and the inside is of a brown and quite soft down, which seems to have been collected from the stems of the sumach, which are covered with a soft wool of this color, and the plant grows in great abundance here; the inner diameter of the nest is hardly a geometrical inch at the top, and the depth scarcely half an inch. I have taken peculiar care of it, as well as the nest of the Hanging-bird,

and shall send them by the first opportunity, and am sure you will join with me in the adoration of that Being, who has endowed these creatures with such natural instinct, to guard against the wiles of man and other enemies: but what creature is there either offensive, or inoffensive, but some of its species has fallen a victim to the rapacious hand of man."

In letter 56 (volume 2, pp. 227–228) written at Mystic, in New England, May 20, 1778, he describes the Whip-poor-will as follows:

"At this season of the year, every night you are surrounded with music, not the most harmonic, from frogs, bull-frogs, hooping-owls, and the *whipper will*, a bird so named by its nocturnal song, being a constant repetition of *whipper will;* it is also known by the name of the *Pope*, by reason of its making a noise resembling that word, when it alights upon a tree or fence. I have endeavoured several times to shoot one, but owing to its being dark, and their flying so exceedingly swift, I have never been able to kill. By the information I have gathered from the inhabitants, I find it is about the size of a cuckow, with a short beak, long and narrow wings, a large head, and mouth enormous, what is remarkable, it is not a bird of prey; under the throat there is a kind of skin which it can expand, and fill with air at pleasure, and that enables it to make the noise which resembles the word Pope. From this description, I conceive it to be a Musquito hawk, abundance of which are to be seen in the day time; I accordingly shot one; and found it exactly correspond to the description of the other, only I could not perceive that loose skin under its throat; I rather think that circumstance is imaginary, and am apt to conclude, that the Musquito hawk and whipper-will are the same bird."

In letter 58 (volume 2, pp. 276–277) written at Sherwood's Ferry, upon the Banks of the Delaware, December 10, 1778, he describes his pleasure at making the personal acquaintance of the " * * * Mocking-bird, which derives its name from imitating the note of every bird they hear; its plumage is very simple and not shewy, it is a Summer bird, very difficult to bring up, and has a very melodious voice, which, in my opinion, would far exceed the Bullfinch, if the same pains were taken with it, from its amazing readiness in catching every note it hears. This one I saw imitated a cock in such a manner, that you could hardly believe but that there was a

cock crowing in the room. The inhabitants say this bird is so very shy, that if any person discovers its nest, which is mostly built in bushes, and looks at its eggs, it will never return again to the nest. When a nest of young ones are taken, and put into a cage, they take great care to hang it where the mother cannot get at it, for if she can, she will feed them three or four days, and finding she cannot release them flies away, after which, the young ones shortly die, as in general they cannot eat what is given them? but the inhabitants attribute their death to the mother, who, they say, the last time she feeds them, contrives to give them poison, in order to release them from captivity.—If that really is the case, it shews how repugnant it is to the principles of nature, to confine any thing, and that she calls aloud to partake of the blessings of liberty, but at present it reminds me of my own situation, I must therefore drop the subject."

Finally in letter 69 (volume 2, page 434) written at Jones's Plantation, near Charlottesville, Virginia, December 12, 1779, he describes a, " . . . large ravenous kind of bird that feeds on carrion, nearly as big as an eagle, called a turkey-bustard, from having red gills, resembling those of a turkey, whence it derives its name. It seems to be a species of the kite, hovering on the wing like that bird, and being carniverous. The inhabitants kill them for the sake of their feet, which dissolved into an oil, is esteemed very salutary in the sciatica, old aches and pains."

U. S. National Museum,
Washington, D. C.

A STUDY OF THE HOME LIFE OF THE NORTHERN CRESTED FLYCATCHER (*MYIARCHUS CRINITUS BOREUS*).[1]

BY HENRY MOUSLEY.

Plate XII.

I SUPPOSE, if all home life studies had to be made under ideal conditions, very few indeed would ever be accomplished, for seldom, if ever, do ideal conditions present themselves. The present case was no exception to the rule, for, although the height of the nesting hole above the ground and its facing south, with a nearby "hide out" only fifty feet away, were all in my favor, especially, for photographic purposes, other things in general were not so good. The telegraph pole in which the nest was situated for instance was only six feet from a railway track, down which numbers of people wandered—as a short cut—to adjacent fields in which wild strawberries and raspberries grew, while the smallness of the entrance hole—only two and one half inches in diameter—prevented the insertion of my hand at the start, to ascertain the number, as well as—later on—the progress of the young each day.

It was on July 1, whilst waiting for a train, that I noticed a Great Crest fly to a telegraph pole some distance away, and then suddenly disappear. Upon investigation, an abandoned Flicker's (*Colaptes auratus luteus*) hole was found six feet above the ground, out of which the Great Crest came in a hurry, upon my tapping the pole. My train not being due for some time, I hid in a nearby bush, and soon ascertained there were young in the nest, as one of the parents—presumably the female—returned on two occasions with food, remaining to brood each time. The day following, I again visited the nest, but forgetting a time-table, I was obliged to set up the camera some seventeen feet from the pole, to avoid fouling the track with the shutter release, the result being that the pictures of the birds, although interesting, were naturally rather small. Two of the most interesting, depict the arrival of the parents at the nest almost simultaneously, the male on hovering

[1] Read at the Fiftieth Stated Meeting of the A. O. U., Quebec, October 20, 1932.

wings waiting for the female—which was at the entrance hole—to go in and feed the young. They never, on this, or any subsequent occasion, entered the nest together. At this point, seeing that the sexes of this species are alike in colouring, it might be asked how was I to distinguish the male from the female. Well, to begin with, there was a difference in the size of the two birds, the female being somewhat the smaller, in addition to which, her actions and mode of behaviour were entirely different from those of the male. She always perched on a guide wire at the side of the pole, and from there flew to the mouth of the hole, at which she always alighted before entering the nest. The male, on the other hand, always used the overhead wires as a perch, and very often from there flew direct into the nest, without even pausing at the entrance, making the photographing of him a most uncertain business at any time. On the present occasion, the young were fed thirteen times in three hours, ten times by the female, and three by the male, no brooding being done—as on the day previous—by either parent, this giving me a clue to the age of the young, probably three or four days, as this is about the time I have generally found brooding to cease in other cases.

I now let three days go by before again visiting the site, on July 5, when the young were fed ten times in three hours, or at the rate of once in every fifteen minutes, nine times by the female, and three by the male. On this occasion, the camera was only four feet six inches from the entrance hole, yet it made little or no difference to the female, who acted just as she had hitherto done. The male, however, altered his tactics entirely, apparently, not liking that "big eye" staring at him, for instead of alighting at, or flying direct into the hole, he would hover five or six feet above it, then drop a foot or more, hover again, with another drop and hover, and then a final drop, and into the hole like a flash. Yet another method, was to go through this same performance only, at the back of the pole, with a final twist round it, and into the hole at the last drop. Up to now, I had not really made up my mind whether to go on with the study or not, in fact, I let another four days go by before again visiting the site, on July 9, when the wealth of interesting data then obtained, during the five hours I spent with the birds, finally settled the matter in the affirmative. To begin with,

I saw the little white sac or faeces removed for the first time by both birds, who up to now had more or less eaten them—no doubt. They were always carried a good distance from the nest before being dropped. The young were fed twenty-five times in the five hours, or at the rate of once in every twelve minutes, eighteen times by the female, and seven by the male. The absence of the camera on this occasion made no difference in the method and mode of approaching the nest, except, in the case of the male, who now gave up the hovering and dropping business before entering the hole, and did not again resort to it, even when the camera was in use. I should, however, have previously mentioned, that whenever the female alighted on the guide wire, or any other favorite perch, particularly a small post just in front of the nest on the far side of the railway track, she almost always kept up a continuous repetition of the harsh call note "wheeeep," no matter whether she had food in her mouth, or not. The male on the other hand was comparatively silent, but he always made use of the loud harsh note on arrival, followed by three other notes in rapid succession only in a lower key, these sounding something like "whip-whip-whip." The female gathered most of her food in the immediate neighborhood of the nest, this consisting for the most part of small insects. Only, on this, and one other occasion, did she bring a somewhat large soft green caterpillar. The male on the other hand, usually went further afield for his food supply, often being absent from the nest for long periods at a time, but when he did return, he generally brought much larger portions than his partner —the usual custom I find with males of the species so far studied— these often consisting of good sized moths and butterflies.

On four occasions, he brought a butterfly which I easily recognized as the Silver-bordered Fritillary (*Brenthis myrina*), an insect having a spread of wings of nearly one and three-quarter inches, which will give you some idea of what the young had to put up with. However I twice saw him quite easily dispose of this same insect, wings and all, at a gulp, so possibly the young were not much inconvenienced after all, especially when we are told by Prof. Herrick in his 'Home Life of Wild Birds,' 1905, p. 184, that he once saw a male water-grampus or Dobson-fly (*Corydalus cornutus*) measuring four inches from the tip of the jaws to the

extremities of the folded wings fed to a single young Kingbird (*Tyrannus tyrannus*) and it was swallowed—wings and all. On one occasion, the male remained on hovering wings at the side of the pole, whilst the female which had preceded him fed the young. Once, he chased off a Robin (*Turdus migratorius*) which had ventured to alight on the wires above the nest, but this was the only time I saw him aggressive, and this remark applies equally well to his partner, for I only once saw her drive off an English Sparrow (*Passer domesticus*) which had dared to make use of her favorite little post, just opposite the nest, and which I have already alluded to. This little post she only made use of when the young had been fed, after which, and before leaving, she would perch in the entrance hole, and from there fly down to the post. It was most interesting to watch her whilst perched in the entrance, where she often remained—quite silent—for six or seven minutes at a time, craning her neck as far as possible in all directions, in an endeavour—I feel sure—to try and locate her partner, for she always went through this same performance when perched on the outside of the hole, before going in to feed the young. Her very look and actions might have been interpreted as: Dear me, I wonder where that partner of mine can have gone to now, it is about time he was back. The day following, the 10th, saw me again at the nest, for another period of five hours watching, during which time the young were fed twenty-three times, or at the rate of once in every thirteen minutes, eighteen times by the female, and five by the male. Things went on much the same as on the day previous, the most exciting incident being the stooping of a Sharp-shinned Hawk (*Accipiter velox*) at the female, as she sat on the guide wire near the nest. I did not see the Hawk approaching, and wondered why the Great Crest made such a precipitous dive into some near-by bushes, where she remained for some time before again venturing into the open. The young could now be heard calling—for the first time—quite plainly, as I sat in my "hide out" some fifty feet away, the notes sounding like "twee-eet" "twee-eet," given in a soft low key.

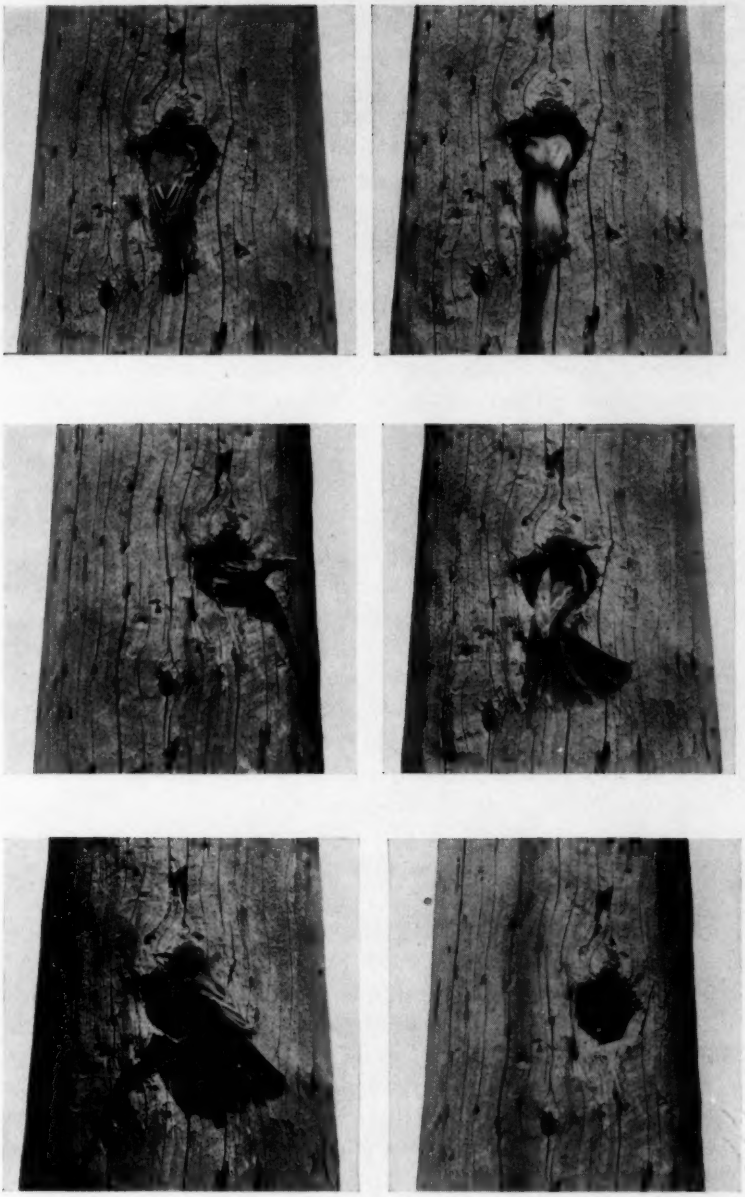
I did not visit the birds again until the 12th, the weather on this occasion being perfect for photographic purposes, and leading me to hope that somehow or other I might be able to circumvent the

male, and obtain another picture of him with a butterfly in his bill, if he again brought one, during the five hours I purposed spending at the nest. As it so happened, he was the first one to put in an appearance, and as he alighted on the overhead wires near the nest, I saw he had brought a ripe wild raspberry, the only one I had so far seen fed to the young, although, I afterwards saw him eat one himself when I was searching for the young in the open. This was interesting, as bearing out what Prof. Beal tells us concerning the food of this species, 6.3 per cent of it only being vegetal —largely wild fruit—the balance, or 93.7 per cent being animal matter, chiefly insects. Soon after this, the female fed to the young the second large soft green caterpillar—already mentioned. The most exciting moment, however, came some time afterwards, when the male brought a butterfly of the same species as previously mentioned, the Silver-bordered Fritillary (*Brenthis myrina*), but he gave me no chance of a picture, as he flew direct into the nest without a stop, and this he repeated twice afterwards when again bringing butterflies. So far, he had scored off me each time, but my turn came at last, when both birds arrived at the nest together, the female going in first, and the male—possibly owing to his somewhat unwieldy load—not hovering outside, as on July 2, but, instead, perching at the mouth of the hole, as on the 10th. As I released the shutter, I can remember saying to myself, I have you now, and I mean to get you again, as I rushed forward to prevent him from entering the hole, as the female came out. Luckily, I was just in time, and he got a bad scare, for he flew up onto the overhead wires and remained there for some time, in fact, long enough to enable his partner to gather some more insects and return to the nest, when he descended also, again perching at the mouth of the hole, and allowing me to obtain another picture of him, this time, not facing to the left, as previously, but, to the right, and with his tail fully spread, as on the 5th, and two other occasions—not hitherto mentioned—this habit of spreading his tail being apparently somewhat characteristic. Again I rushed forward, on the off chance of yet another picture, but this time he would have none of it, and almost in my very face he entered the nest, just as his partner left it, and, moreover, on leaving, actually carried away a faecal sac, thus proving what some birds will dare when they have

young to feed, whilst others, on the contrary, will not go near them, if they know anybody is at hand, or even in sight.

The female in this case was particularly courageous, often going to the nest and remaining at the entrance, notwithstanding the fact that I was only a short distance away and in full view. The rate of feeding increased on this day, the young being fed twenty-six times, or once in every eleven minutes, eighteen times by the female, and eight by the male. Whilst listening to the call of the young about noon, I suddenly became aware of an ominous and rapidly approaching buzzing which, with hardly a moment's warning, developed into a cloud of bees, apparently, intent on swarming on the willow bush under which I was hiding. Luckily, a strong wind was blowing at the time, this, no doubt, influencing them in moving on to a more secluded spot, but it is needless to say my exit at the moment was of a very precipitous and undignified nature.

The day following, I again paid a visit to the site, but owing to the unsettled state of the weather, and a heavy thunderstorm coming on, I only stayed three hours. During that time, however, the feeding of the young was a little more rapid than on the day previous, once in every ten minutes, thirteen times by the female, and five by the male. On two occasions, both birds were on the guide wire together, a thing I had not hitherto seen, the male never having made use of this perch before. It was only the female, however, who did the feeding, the male, apparently, only having come to look on, as he brought no food. Soon after this, the thunderstorm broke, and I had to leave, with the resolve, however, to come again the next day. This I did, it being July 14, or just a fortnight since the nest was discovered. On arrival, both birds were in the vicinity of the nest, and soon gave me to understand that things were going to be pretty lively, for during the first hour, they fed the young ten times, or at the rate of once in every six minutes, this rate, however, falling off somewhat later on, although, for the whole period of five and one-half hours, the time I was at the nest, it averaged once in every eight minutes. It was on this day that the female Great Crest drove off the English Sparrow from her favourite little perching post, which has already been alluded to. Once again, both birds were on the guide wire



NESTING OF THE GREAT CRESTED FLYCATCHER.

together, but on this occasion the male had food in his bill, which he ultimately fed to the young, several minutes, however, after his partner had left the nest. He again brought four of the butterflies previously described, but the female was unable to help me on the one occasion when she happened to arrive at the same time as her partner, for, he, instead of perching at the mouth of the hole, elected to do so some distance above it, and, although, I released the shutter, he must have been out of range of the lens, for he did not appear in the resulting picture. All this time, I was anxiously looking for the young to leave the nest, but it was not until about noon that I saw one of them bob up, apparently, in the centre of the hole. I took a chance with the camera, but no results appeared in the negative. About an hour or so afterwards, I came to the conclusion, from the actions of the female, who kept slowly flying past the entrance hole, that she was trying to induce the young to come out of the nest, but apparently, without any immediate results. However, some two hours later, or to be precise, four o'clock, a young bird once more appeared silhouetted in the centre of the hole, and this time I obtained a faint outline picture of it. Although I remained for another two hours, no more was seen of it, so I came to the conclusion that it would be the next day before the young would leave their home. This proved to be the case, for on arrival early the next morning, the 15th, the nest was empty and neither the old birds or the young were anywhere to be found. After a long interval, and without seeing any signs of them, I decided to extract the nest from the hole, which was eight inches in depth, by first raising it up with small sticks, and then pulling it out at the entrance, which proved by no means an easy task. However, I eventually succeeded, and was never so surprised in my life as to find it one of the most immaculately clean nests I have so far handled. Not a single mite was found anywhere, as I pulled it to pieces bit by bit. It was composed entirely of dry grass stems and rootlets as a foundation, whilst the lining consisted of four small feathers, a quantity of fine animal fur, a little vegetable fibre, but no signs whatever of the proverbial snake skin. Its average width was about six inches, whilst the approximate total depth was two and three-quarter inches. I shall never know the exact number of young it contained, although, I think it was not more than three,

this being the number I thought I made out some hours later, when I at last discovered the old birds about three hundred yards to the north of the nest. They were in a tangle of small birch-trees, willows, and other shrubs, the intervening spaces being covered with brushwood and very long grass, making it impossible to get about in a hurry, but forming a wonderful get-away for young birds. I really only saw one youngster quite distinctly at close quarters, in a small birch tree, and as it seemed disposed to remain there, I decided to risk a time exposure instead of a snap-shot, but as ill luck would have it, just as I was about to release the shutter, it flew off, and I was unable to follow quickly enough to locate it again, owing to the dense tangle of brushwood and tall grass already mentioned. What I can remember of it, however, was that its head—more especially—was perfectly free of any natal down, whilst the back and upper parts were of a darker shade than those of the parent birds, as well as being of a fresher tint. The reason it took me such a long time to find the old birds, was owing to their being perfectly silent, but when at last I did discover them, and appeared on the scene, they lost no time in warning the young, the female, especially, keeping up a constant repetition of the harsh "wheep" note. On one occasion, I saw the male eat a wild raspberry and obtained a picture of him. On another occasion—he swallowed a second Silver-bordered Fritillary wings and all quite easily making his thirteenth capture of the insect, eleven of which had previously been fed to the young. Summing up, I had been with the birds thirty-five hours, thirty at the nest, and five in the open. During this time, I had seen the young fed one hundred and sixty times, forty-two by the male, and one hundred and eighteen by the female, the average rate of feeding for the whole period being once in every eleven and one-quarter minutes.

The faeces had been carried away twenty-seven times, but how many had been eaten, of course it is impossible to say nor can I be sure how many times I may have missed seeing them being carried away, owing to the varying light at times, and the rapid exit of the birds from the hole, for they never paused for an instant at the entrance when engaged on this duty. As regards the incubation period for this species, I find it is generally given as from thirteen to fifteen days by most authors, whilst the shortest record

for the young to leave the nest that I can find, is that given by Mrs. Margaret Nice, in her 'Birds of Oklahoma,' 1931, where, on page 119, she gives a specific instance of five eggs being hatched on June 18 and the young leaving the nest on the 30th, a matter of twelve days only. On the other hand, Ora W. Knight in his 'Birds of Maine,' 1908, says on page 311, that the young are ready to leave the nest in about eighteen days after they are hatched, which more nearly coincides with my experience, for if I am right in assuming the young to have been at least three days old when I found them on July 1, they would be eighteen days old when they left the nest on the 15th. Even assuming they were only hatched on the very day when I found them, it was not until the 15th or possibly late on the 14th that they left the nest, an interval of a fortnight at the very least, this being the period given by both Bendire and Gentry in their respective works.

Looking back for a moment, it scarcely seems credible that these birds should have been allowed to bring up a brood, in view of the number of persons—mostly young ones, who knew of the nest, as on one day alone, I helped some twenty both over and under my release line. Is it any wonder then that I hesitated, at the commencement, whether to go on with the study or not?

Before concluding, I should like to draw attention to a matter I have not seen referred to so far, i. e., to the possible ventriloquial properties of this bird's voice. By this, I do not wish to imply that the bird is cognizant of the fact, and makes use of it for a purpose, but it certainly struck me on several occasions—for which reason I paid especial attention to the matter—that the bird did not appear to be in the exact spot from which the sound seemed to come. At present, apparently, there is no scientific explanation of the phenomenon of ventriloquism. To a large extent—as suggested by Mr. Aretas Saunders in his 'Bird Song,' 1929, p. 81—it may be due merely to a psychological condition of the hearer. However, be that as it may, the subject certainly seems to be attracting the attention of other observers, judging from the account given by Mr. Eric Parker in his 'English Wild Life,' 1929, pp. 107–08, of his experiences with a baby Moorhen (*Galinula chloropus*), which he sums up in the following words: "And so I discovered that a baby moorhen has the power of a ventriloquist; it can throw its

voice where it chooses, or anywhere without choosing. And is this for a purpose? Does it help to protect the little creature that if there are enemies about it can call to its mother and they cannot tell where the call comes from? I know no answer. I cannot find the fact that the young bird is ventriloquial mentioned in any book, and I know no one who has heard and looked for the bird calling."

In conclusion, I have appended a table of summaries of the principal happenings at the nest—as in former papers.

Period of Observation July 1–15, 1932.
Hours at Nest, 30.
Times Fed by Male, 42; Female, 118.
Times Brooded by Female, 2.
Times Faeces Removed by Male, 10; by Female, 17.
Average Rate of Feeding, Once in 11.25 min.

4073 Tupper Street,
Montreal, Canada.

A NEW BEWICK'S WREN FROM THE WESTERN PANHANDLE OF OKLAHOMA.

BY GEORGE MIKSCH SUTTON.

IN identifying a collection of birds made by Mr. John B. Semple and the writer in the vicinity of Kenton, Cimarron County, Oklahoma, during September and October of 1932 and later, in September 1933, some difficulty was experienced in determining the subspecies of *Thryomanes bewicki* (Audubon) represented in the region. According to Mrs. M. M. Nice (Birds of Oklahoma, 1931, 135) the subspecies found throughout most of the state is *T. b. cryptus* Oberholser, though eastern *T. b. bewicki* may occur "on the eastern border." During 1932 two specimens of this Wren were taken in the Kenton region and these were provisionally identified as *cryptus*, though plainly they did not agree with that form in the general color-tone of the upper parts. In 1933 we made a special point of procuring as many Bewick's Wrens as possible and succeeded in getting eight more—one a poor specimen (embalmed) in the midst of the post-juvenal molt. Our nine adult specimens, which are gratifyingly uniform, have been compared with an extensive series of *Thryomanes bewicki* (146 specimens in all) and prove to be of a race that is apparently without a name. We propose to call this bird

Thryomanes bewicki niceae,[1] subspecies nova.

Type No. 113,329, male, collection of Carnegie Museum; Kenton, Cimarron County, Oklahoma, October 1, 1932. Collected by George M. Sutton.

Subspecific characters.—In color resembling *T. b. eremophilus* Oberholser more closely than any other form of the species, but grayer throughout, especially on the upper parts and sides, and less buffy below. Much grayer throughout than *T. b. cryptus*, the general color of the back being close to that of the San Clemente Bewick's Wren, *T. b. leucophrys* (Anthony), a race which is strikingly dissimilar to *niceae* in other respects. In size about the same as *eremophilus* and *cryptus* and therefore noticeably larger than either eastern *T. b. bewicki* or western *T. b. spilurus* (Vigors). The grayish tone of the upper parts, especially of the middle tail feathers and upper tail coverts is decidedly noticeable.

[1] In honor of Mrs. Margaret Morse Nice, author of *The Birds of Oklahoma*.

Measurements of Type.—Wing, 57 mm.; tail, 57; exposed culmen, 13.5; tarsus, 18.5.

Measurements of males[1] (eight).—Wing, 56 to 60 (average, 57.7) mm.; tail, 57 to 62 (average, 59.5); exposed culmen, 13 to 14.5 (average, 13.6); tarsus, 18 to 19.5 (average, 18.9).

Measurements of females.—Wing, 54, 54 mm.; tail, 59, 57; exposed culmen, 12, 13; tarsus, 18, 18.5.

Description.—Above uniform grayish brown, of a shade between pale Hair Brown[2] and pale Mummy Brown, slightly rufescent on the lower back and rump, the feathers of which have more or less concealed white spots; upper tail coverts Deep Mouse Gray, rather distinctly barred with Fuscous. Wing quills Fuscous, edged externally with grayish brown of back; secondaries and tertials indistinctly barred with blackish brown; wing coverts like the back. Middle tail feathers and basal portion of outer webs of the rest (with the exception of the outermost pair) Deep Mouse Gray, regularly barred with black; *two*[3] outermost pairs with broad grayish tips and bold whitish barring on the outer webs, this barring much more extensive on the outer pair; other rectrices more or less narrowly tipped with gray; rest of tail black. Superciliary stripe whitish, with faint buffy cast; lores and cheeks grayish white, somewhat streaked with dark grayish brown; post-ocular streak Hair Brown of a shade slightly darker than that of crown; sides of neck Light Neutral Gray with faint brownish cast. Under parts dull white, nearly clear white on chin and throat, faintly buffy on breast, and washed with Mouse Gray on sides and flanks; crissum heavily barred with black; lining of wing grayish white.

Description of juvenal plumage.—Adult males and adult females are alike in color. The juvenal is, however, browner than the adult. A juvenal male taken near Kenton on July 5, 1926, by E. L. Little, Jr. (Collection of University of Oklahoma Museum, No. 5661) is noticeably *browner* throughout than any of our fall specimens, the under parts being strongly buffy and the feathers of the cheeks and malar region being indistinctly tipped with Fuscous.

Remarks.—In view of the fact that the type locality of Oberholser's *eremophilus* is extreme southwestern New Mexico (Big Hatchet Mountains, Grant County), a region that is certainly

[1] Measurements of two juvenal males not included here.

[2] Capitalized color-names used here are from Ridgway's *Color Standards and Nomenclature* (1912).

[3] According to Oberholser's original description of *eremophilus* (Proc. U. S. Nat. Mus. XXI, No. 1153, 1898, 427) the *three* outermost pairs of rectrices in that form have "broad grayish tips." In the twenty specimens of *eremophilus* at hand nearly all are so marked; but in all of our *niceae*, save one, only *two* pairs of rectrices have these broad whitish tips. Apparently this restriction of gray tipping of the rectrices is characteristic of *niceae*.

more arid than the western Panhandle of Oklahoma, it is not surprising that our Kenton birds should prove to be different from this form. That they are decidedly more distinct from *cryptus* (type locality San Antonio, Texas) than from *eremophilus* is somewhat surprising and this close affinity with *eremophilus* makes it somewhat difficult at the present moment to postulate the range of *niceae*. Our bird apparently is distinctly migratory in the Oklahoma Panhandle, so there is a chance that some of our specimens (all were taken in the fall it will be remembered) are transient individuals from farther north, from Colorado perhaps, or from western Kansas. The fact that the only specimen of *eremophilus* in the collection of the U. S. National Museum (No. 62,875, Washington, Utah) from regions to the north of Arizona and New Mexico is decidedly closer to *niceae* than any other individual in this Museum's series of twenty specimens of this race lends color to our belief that *niceae* breeds along the eastern foothills of the Rocky Mountains in western Kansas, extreme western Oklahoma, eastern Colorado, and extreme northwestern Texas; and here and there in the mountains of northern New Mexico[1] and Arizona and of southern Colorado and Utah. The writer is not familiar enough with the Rocky Mountain region to suggest the extent of the particular ecological association in which this bird may find a suitable home, but *niceae* is apparantly to some extent a mountain-inhabiting form and to some extent a desert-inhabiting form. As to the winter range of *niceae* we have no knowledge at present, save that a single male (?) bird in the Cornell University collection (No. 2173) from Brownsville, Texas (February 5) is apparently too gray for *cryptus* and the date suggests the possibility of its being a wintering individual of *niceae*. At any rate such an easterly specimen as this could hardly be *eremophilus*.

Distribution of Thryomanes bewicki in Oklahoma.—From the

[1] Mrs. Bailey (Birds of New Mexico, 1928, 539–540) tells us that *T. b. eremophilus* "breeds irregularly in the lower parts of the mountains of New Mexico, but seems to be absent from many parts of the state where the conditions are apparently favorable." It is our present belief that *eremophilus* is found throughout southern and perhaps central New Mexico, but that birds reported from the Chuska Mountains and from Shiprock (see Mrs. Bailey's map) are probably closer to *niceae* than to *eremophilus*, and that there may be a hiatus in the range of *Thryomanes bewicki* across north-central New Mexico just as there is in the Panhandle Plain region of Oklahoma.

fifteen Oklahoma specimens of this species at hand it is evident that at least two subspecies are to be found in the state. Specimens from Canadian, Cleveland, and Caddo Counties are plainly *cryptus* (as Mrs. Nice has told us). They are strikingly browner than our Cimarron County birds, and the two strictly comparable[1] specimens from central Oklahoma (University of Oklahoma Museum Collection, Nos. 3118 and 3315) taken in November and December respectively, both have the *three* outermost pairs of rectrices broadly tipped with grayish-white.

The Oklahoma range of *T. b. niceae* is apparently restricted to the far western Panhandle. It is highly doubtful that any form of Bewick's Wren breeds in the Panhandle Plain section east of Cimarron County. Just east of this plain *T. b. cryptus* is found, and this subspecies apparently ranges throughout central and southern parts of the state unless the birds "on the eastern border" are the eastern *T. b. bewicki*.[2]

For assistance in the preparation of this paper the author is indebted especially to Dr. A. I. Ortenburger, of the University of Oklahoma, Norman, Oklahoma; to Mr. R. Crompton Tate, of Kenton, Oklahoma; to Dr. Herbert Friedmann, of the U. S. National Museum, Washington, D. C.; and to Mr. W. E. Clyde Todd, of the Carnegie Museum, Pittsburgh, Pennsylvania.

Laboratory of Ornithology, Cornell University,
Ithaca, New York.

[1] Two specimens from the Collection of the University of Oklahoma are so worn and faded as to be almost albinistic in appearance. One of them may, indeed, be an albino.

[2] No specimens from eastern Oklahoma are available at present.

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• TABER, WENDELL, 6 Rollins Place, Boston, Mass.
TANNER, JAMES T., 67 Greenbush St., Cortland, N. Y.
TROUSLOT, R. B., P. O. Box 373, Walnut Creek, Calif.
• VALENTINE, MISS MARGUERITE E., 18 E. 66th St., New York, N. Y.
WICKS, DEAN ROBERT RUSSELL, Princeton University, Princeton, N. J.
WOODLETON, MRS. HELEN SAUNDERS, 454 Seventh St., Brooklyn, N. Y.

GENERAL NOTES.

Townsend's Sooty Albatross.—In substantiation of my claim that Townsend really secured his specimen of the Sooty Albatross (*Diomedea fusca* Audubon) off the mouth of the Columbia River (cf. Auk, XLVIII, pp. 106–109) I submit the following extract from an article by Townsend published in the 'Literary Record and Journal of the Linnaean Association of Pennsylvania College' [Gettysburg], III, 1847, pp. 88–92. "On the 12th day of Dec., 1834, I set sail in the good ship 'May Dacre' of Boston, from the mouth of the Columbia river, bound for the Sandwich islands.—Off Cape Disappointment and for several hundred miles out to sea, we observed great numbers of sea birds of various kinds, several of which I myself described and published as new species. The little Guillemots (*Uria*) were tumbling and rolling along the surface half swimming, half flying, and looking almost precisely like large eggs as they sported across our bow. From this resemblance, they have universally among sailors obtained the name of 'Egg Birds.' Large Cormorants (*Phalacocorax*) of several species, were very abundant, as were also various kinds of Petrels (*Procellaria*) and Mother Carey's Chickens (*Thalassidroma*).

"A large brown Albatross (which I named *Diomedea fusca*) inhabits these seas. It differs considerably from the common white species which is so abundant around the two great capes. Though smaller than the Cape Bird, it yet measures from twelve to fourteen feet across the wings. No one who has not seen this noble bird in flight can form any idea of the extreme ease and grace with which it skims over the foaming billow. Its long, falcate wing seems never to tire.—Sometimes it seeks the higher regions of the atmosphere, sailing, without any apparent motion of its pinion, and performing the most sublime aerial evolutions. Again it descends to the surface and floats over the dashing and sparkling waves; now lost to sight in the deepest trough of the sea, and instantly reappearing on the crest of the next billow.—On, on, he flies over the wild and wasteful ocean, without ever appearing to rest, except when he alights to pick up something from its surface."

In this connection it is interesting to note the treatment of Trudeau's Tern in the A. O. U. 'Check-List.' Here is another species of which the type is extant, taken nearly a century ago and with no subsequent record from North America and yet it is accorded full status while the Townsend bird is relegated to the Hypothetical List.—Frank L. Burns, *Berwyn, Pa.*

[With due regard for Mr. Burns' interesting and apparently hitherto overlooked quotation and with no intention whatever of detracting from Townsend's credit, since I consider Audubon the one at fault, I am not convinced that this antarctic species could have come from the North Pacific. In the list of the birds of Oregon, in the Appendix to his 'Narrative,' Townsend mentions but one brown Albatross '*Diomedea fusca*' but in his subsequent list (Jour. Acad. Nat. Sci. Phila., 1839) prepared after the

appearance of Audubon's fifth volume, he adds *D. nigripes*, apparently not realizing, until the appearance of Audubon's description, that he had obtained two species of these birds. As Townsend himself never described *D. fusca* and had not seen Audubon's description of it at the time he published his first list, I feel certain that the bird to which he referred was in reality *D. nigripes*, a common bird off the coast of Oregon. Audubon, too, probably did not distinguish between the two until after he had described *D. fusca*. It is curious, too, that Townsend compared his "*D. fusca*" in Mr. Burns' quotation with the white Wandering Albatross and does not mention *D. nigripes*. To illustrate the apparent difficulty under which Townsend labored in trying to remember details of the capture of certain birds, after he had disposed of his specimens we find that in his first list he very properly made no mention of *Fringilla mortoni*, an undoubted Chilean bird, but after Audubon had named and described it as from the Columbia River, Townsend entered it in his second list just as he did the other "Brown Albatross." It is significant that for nearly all the undoubted Columbia River specimens quoted by Audubon, there seem to have been definite labels but none in the case of the supposed Chilean birds nor on such undoubted Chilean specimens as I have seen. With regard to Trudeau's Tern Mr. Burns' point is well taken!—WITMER STONE.]

Little Blue Heron and American Egret in the West Virginia Panhandle.—On July 30, 1933, Mr. Percy Dowden, of Bethany, Brooke County, West Virginia, brought me a female Little Blue Heron (*Florida caerulea*), in white plumage, that had been shot by a farmer along Castleman's Run not far from its mouth. The specimen is now in the Carnegie Museum at Pittsburgh.

On the evening of the same day. Mr. Edwin S. Miller and myself saw an American Egret (*Casmerodias albus egretta*), flying back and forth along the Buffalo, not high in air.

Twenty years ago white Herons were virtually unheard of along Buffalo Creek. Nowadays they are of fairly regular occurrence, a few individuals of the above-named species being noted practically every summer.—GEORGE MIKSCH SUTTON, *Cornell University, Ithaca, New York.*

Black Ducks as Ice Breakers.—We have, in the woods just back of our house, in Newton Centre, Mass., a shallow skating pond, several acres in extent. This pond, when flooded early enough in the fall, before freezing, is frequented by a number of Ducks, generally Blacks, with a sprinkling of Mallards; but this year accompanied by a bunch of Pintails, formerly rare in New England, but seen more frequently of late; and quite a number of Wood Ducks; and late in the afternoons, for two or three weeks, it was not unusual to have thirty or forty Ducks pitch in, just at dusk, to spend the night.

On November 11, just before lunch, I had strolled down to see what Ducks were there, when I discovered, to my surprise, that the pond had

been frozen completely over the night before. Wondering just what any visiting Ducks would do under the circumstances, I had just sat down to watch, when a young male Pintail came in, half circled, and then fluttered lightly down onto the ice, which, to my surprise was strong enough to support him; and there he stood, very erect, and perhaps a couple of hundred feet from where I sat watching him through a pair of 8x binoculars.

As we sat there, watching each other, a pair of Black Ducks dropped in, about fifty feet this side of the Pintail; and they, being apparently heavier than the Pintail, broke through; and there they sat, each in his little hole in the ice, watching me for several minutes, until, apparently deciding that I was harmless, they started to swim over to the Pintail. As they were quartering away from me, I could see every motion.

Discovering almost at once that the ice was too thick to swim against, they moved their heads back, in order to bring back their centers of gravity; and then, lifting their breasts just high enough, and paddling rapidly, pushed their breasts up over the ice; and then bringing their heads and centers of gravity forward, pressed down on the thin ice, and broke it. I watched them doing this repeatedly, until, after breaking the ice for twelve or fifteen feet towards the Pintail, they all three took fright at some movement of mine, and left.

Professor A. A. Allen, writes me on this subject: "I have frequently watched Ducks on thin ice of my own pond and at the head of Cayuga Lake, but never could make up my mind that they were breaking the ice intentionally. They would push up onto it with their breasts as you describe and if it were heavy enough to hold their weight, would clamber up onto it, but frequently it would break under them."

Probably these ducks of mine would have "clambered up onto" the ice also if they had not broken through, but with this thin ice, and I was watching every movement, they made no attempt to do so, and their repeatedly breaking through it as they did, seemed to me to be deliberate. They could easily have flown to the Pintail if they had so desired.—Fred H. Kennard, *Newton Centre, Mass.*

European Teal in South Carolina.—On February 13, 1930, Mr. Richard E. Bishop, of Philadelphia while duck shooting at the Santee Club, South Carolina, killed a male European Teal (*Nettion crecca*) which he kindly presented to the Academy of Natural Sciences of Philadelphia where it is preserved as a skin in the study series of Anatidae. Unless I am in error this is the first record of the species for the state.—Witmer Stone, *Academy of Natural Sciences, Philadelphia.*

First Record of Ring-necked Duck in Delaware.—During the late winter and early spring of 1933, I found this Duck in comparative abundance on the recently completed Hoopes Reservoir near Wilmington, Delaware. I first saw the species (with which I was well acquainted in South Carolina) on the reservoir on March 4, 1933, a small flock, which I

at first took for Scaup, but studying them through 8x binoculars I soon realized that they were not Scaup but Ring-necked Ducks (*Nyroca collaris*). There were five of them—four males and one female—and they continued to feed throughout our stay.

The writer observed Ring-necks on several other occasions in increased numbers. On March 16 two flocks were seen, one containing thirteen individuals and the other twelve. Males predominated in both flocks. On March 24 a single flock of 24 were observed. They were last seen on April 1, a flock of twenty.

As far as I know this is the first record of the species for the state. In all probability, however, it has occurred previously and not been recorded because of the scarcity of ornithological observers in the region.—J. Willcox Brown, *Montchanin, Delaware.*

Incursion of American Scoters in Norfolk, Connecticut.—In the early morning of October 22, 1933, the citizens of Norfolk, Connecticut, were much surprised to find that some 300 American Scoters (*Oidemia americana*) had dropped into the town during the night. A milk-delivery man and others who happened to be out during the night informed me that the birds came from near midnight to about six o'clock in the morning. They did not all descend at once, and undoubtedly represented individuals of several flocks. The fore part of the evening was comparatively warm and clear, but by midnight a low dense fog hung over this section. It seems probable that the aviation light on Haystack Mountain, which is 700 to 800 feet higher than the adjacent valley, attracted the birds, and the dense fog beneath may have appeared as a body of water. It appears that they had flown a considerable distance before alighting. Eight stomachs of birds killed by the fall were examined and all were practically empty, indicating that some time had passed since the birds had had any food.

Between fifty and seventy-five Scoters were picked up. About half of these were dead, having been killed by the fall—by hitting trees, buildings, or hard ground, and the remainder injured so that they could not at once fly. Many were reported to have had broken bones. An autopsy showed the sternum to have been crushed in two birds and a wing and leg broken in another. These and others less carefully examined showed internal hemorrhages indicating that they had struck the earth or objects with terrific force. The autopsy indicated that the birds had been in normal health and all were in good flesh. Senator Frederick C. Walcott informed me that about 200 of the birds succeeded in landing on Toby Pond on his estate and that after resting for a day they resumed their migration. At the time of my visit to Norfolk two days after this unusual incident, there were about twenty birds left in the vicinity that were still unable to fly.

It was of interest to note that of the birds observed males outnumbered the females by more than three to one. Reports of other observers indicate a large preponderance of males over females. It would be interesting to

know where the birds had come from and whether or not this was their normal migration route. The incident indicates that they may migrate in flocks as a species not in company with related species.—CLARENCE COTTAM, *U. S. Biological Survey, Washington, D. C.*

Serrations on the Bill of the American Merganser.—While examining the bill of an American Merganser (*Mergus m. americanus*) I noticed that the serrations of the upper mandible were fewer than on the lower 28 to 45 respectively. Further examination brought out the fact that the seven serrations nearest the base of the lower mandible pointed forward instead of backward as in the case of the others, a fact that I have not found noticed in the literature.—WILLIAM H. MOORE, *Scotch Lake, N. B.*

An Aerial Nest of the Turkey Vulture (Cathartes aura septentrionalis).—We have recently had occasion to examine a Turkey Vulture's nest located some forty feet up in a cavity of a live beech tree. All the others that we have found have been on the ground, in, or in the near proximity of hollow logs. This particular beech, growing in Union Twp., Clermont Co., Ohio, has attracted the attention of the writer for the past two years. During this interval, it has provided a home for an interesting succession of inhabitants. When first investigated the hollow in its top, in early March, 1932, held a Barred Owl (*Syrnium v. varium*) incubating four eggs. These eggs were collected. and three additional ones were laid, of which two hatched.

Several months after the young Owls had been raised to maturity and left their home, three Gray Squirrels (*Sciurus c. carolinensis*) had altered this former nursery into a storehouse for walnuts, as well as a place for concealment and rest on sunny afternoons. They were taken for museum specimens.

It was with a good deal of anticipation, therefore, that we clambered up this beech in early spring to find several cast up Owl pellets and a freshly killed White-Footed Mouse (*Peromyscus l. noveboracensis*). Things appeared as though the first boarders in this beech for 1933, would again be Barred Owls. However, though we carefully examined the nest each week, nothing more of interest was noted until April 22, when Woodrow Goodpaster reported to me that he had found a Turkey Vulture incubating a single egg in this tree. Somewhat doubtful, we examined the nest the following day and found that it was a Turkey Vulture and that it was now incubating two eggs. The bird was exceedingly tame and permitted itself to be stroked and lifted from the eggs in much the same fashion as an old hen. On later visits this procedure was repeated except that the Vulture began to protest over our excessive handling by its usual method of defense—vomiting. Only on one occasion did the bird leave the nest without our first removing it. This, although by no means positive evidence, would lead me to believe that both sexes incubated the eggs.

Realizing that some interesting facts might be revealed by this unique

nesting, we made it a point to examine the nest at least once a week until it was destroyed. Following are our notes as we made them after each investigation.

April 27—Lifted incubating bird from nest. Examination of both eggs showed that one had been chipped to the membrane.

April 29—Vulture incubating. The chipped egg had been crushed and trampled into the nesting debris. Another egg had been deposited leaving the nest still with two eggs.

May 6—Bird flushed as I started climbing. Only one egg in the nest. Markings on this egg showed it to be the last deposited.

May 14—Bird incubating one egg.

May 20—Bird still incubating single egg.

May 28—Mr. C. J. Goetz, of Cincinnati, banded the incubating Vulture. The single egg showed a polished surface.

June 3—Nest had been destroyed.—KARL H. MASLOWSKI, *950 Glenwood Ave., Cincinnati, Ohio.*

Errata: African Vultures.—Plate 4 of the album of 'Abyssinian Birds and Mammals' from paintings by Louis Agassiz Fuertes, published by Field Museum of Natural History is mis-identified on the face of the plate and this error unfortunately is continued in the title which appears in the List of Plates as well as on the front and back of the plate itself. The bird shown is the Hooded Vulture (*Necrosyrtes monachus*), not the White-necked Vulture (*Pseudogyps africanus*).

It is thought worth while to call the attention of libraries and owners of the album to this slip, since the plates are so extensively used for reference by artists and others not intimately familiar with African birds.—RUDYERD BOULTON, *Field Museum of Natural History, Chicago, Ill.*

Coots Breeding on the Delaware Marshes Below Philadelphia.—Having been informed by Mr. Delos E. Culver that he had seen a brood of young Coots (*Fulica americana*) with their parents on the Tinicum marshes, Delaware Co., Pa., I visited the locality on July 29, 1933, and saw one adult and four young, the latter about two-thirds grown. The whole group was sitting on a submerged, moss covered log, making a fine display.

On July 22 I saw in the same locality an adult Pied-billed Grebe (*Podilymbus podiceps*) with eight young about three-quarters grown and about half a mile away another adult. That evening there were present seven Dowitchers (*Limnodromus griseus*) a species which I had never seen here before. Florida Gallinules (*Gallinula chloropus cachinnas*) and white Herons have been very abundant all summer and on the evening of the 29th, there was a flight of approximately one hundred of the latter taking wing for the New Jersey side of the river possibly for a roost near the sea shore. About three-quarters of them were Egrets (*Casmerodius alba egretta*) and the rest Little Blues (*Florida caerulea*). The breaking of the dykes on the marshes, some months ago, has flooded large areas and the

water birds have evidently not been slow to take advantage of the situation.—V. A. Debes, *Prospect Park, Pa.*

Hudsonian Curlew in the West Virginia Panhandle.—On the afternoon of July 24, 1933, a Hudsonian Curlew (*Phaeopus hudsonicus*) flew over the village of Bethany, Brooke County, West Virginia, headed southeastward. The bird's loud cries attracted our attention to it. It was not following Buffalo Creek, the largest stream of the vicinity, nor had it, apparently, been feeding nearby. There had been a heavy rain and considerable wind during the morning, and the bird had probably been blown off its course by the storm.

I have not heretofore noted this species in the West Virginia Panhandle, and this record is apparently the second for the state, a specimen having been taken at Cranberry Glades, Pocahontas County, on May 25, 1926, by Mr. A. B. Brooks and his co-workers (Auk, XLIII, 1926, 541; and Wilson Bulletin, XLII, 1930, 246).—George Miksch Sutton, *Cornell University, Ithaca, N. Y.*

Spotted Sandpiper Eludes Eastern Kingbird by Diving.—On July 29, 1924, at Moorhead, Minnesota, while I watched from a bank of the Red River, a mild exigency caused a Spotted Sandpiper (*Actitis macularia*) to exhibit its propensity for diving. A Kingbird (*Tyrannus tyrannus*) gave chase to the passing Sandpiper which was flying about three feet from the surface of the water near the center of the forty yard stream. After a chase of about ten yards, at which time the Kingbird was close upon the innocent passer-by, the Sandpiper dived into the water. It remained submerged four or five seconds and then as it came to the surface it took wing directly. On shore it stopped to preen before continuing its course down the river.—Adolph Murie, *Museum of Zoology, Univ. of Michigan, Ann Arbor, Michigan.*

The Western Willet in Michigan.—Mr. W. P. Proctor, of Benton Harbor, Michigan, has accorded me the privilege of recording what seems to be the second definitely known occurrence of the Willet in the state of Michigan—near Benton Harbor, on August 7, 1933. The only previous record that I can find in available literature is for Ann Arbor in May, 1889 (Bent, 'Life Histories of North American Shore Birds,' Part 2, 1929, p. 41). There is little doubt but that both records refer to the western form (*Catoptrophorus semipalmatus inornatus*).

Mr. Proctor reported four birds in all, on the beach of Lake Michigan. At first, only two were seen. These soon flew out over the Lake, where they were joined by two others coming from a northerly direction, when all four returned to the beach near the observer. Altogether, Mr. Proctor had some or all of the birds before his glasses for more than an hour, sometimes at distances of not more than forty feet. He watched them feeding, preening, and sleeping, and several times heard their characteristic notes. It is his opinion that, because of their tameness, all four were birds of the

year.—Francis M. Weston, *Bldg. 45, U. S. Naval Air Station, Pensacola, Fla.*

Rufous-necked Sandpiper Nesting in Alaska.—The first eggs of the Rufous-necked Sandpiper (*Pisobia ruficollis*) collected in North America—possibly the only known eggs of this species in any collection—were received recently, with the nest and skin of the brooding parent (not sexed), by the Chicago Academy of Sciences from its representative, Dwight Tevuk, at Cape Prince of Wales, Alaska.

According to published records the only available evidence of the nesting of this species on the American continent was presented in an account by Alfred M. Bailey (Condor, XXVIII, p. 32). On June 14, 1922, he observed a pair building a nest along a stream bed—a small pit similar to the nest of the Western Sandpiper (*Ereunetes mauri*) in which the birds had placed about twenty small willow leaves. Later the nest had been abandoned.

W. Sprague Brooks (Bull. Mus. Comp. Zool., LIX, 1915, p. 382) recorded two sets of eggs of this species taken at the head of Providence Bay, northeastern Siberia, on June 11, 1913, but Bent was unable to locate these eggs or any others of this species.

The specimens received by the Academy were taken June 23, 1933. They are quite similar in appearance to those of the Western Sandpiper, but are not so thickly marked and hence are lighter in general tone. Also, they are somewhat larger, averaging 32 mm. by 22.6 mm.: (31.5 x 22.8; 33.6 x 22.3; 31.8 x 22.5; 31.0 x 22.8).

The nest was made of dry willow leaves and dry tundra moss. There were present a few feathers from the parent, one of which was a characteristically marked scapular.

The skin, showing the bare abdomen of a breeding bird, together with the nest and eggs, were shipped in a single container, and the usually brief field note of the collector was enlarged by the words, "on plains." Mr. Bailey explains that this signifies that these specimens were taken on the flat tundra in distinction to the hilly country beyond, which is usually described as "up hills," and is the locality in which the Western Sandpiper usually nests at Cape Prince of Wales.

The collector sent also two other containers in each of which were the eggs, nest, and skin of the Western Sandpiper. These were labelled "least sandpiper." The strange bird was marked simply "sandpiper" and the supplementary description as to the locality was obviously intended to make a further distinction.—Edward R. Ford, *Curator of Birds, Chicago Academy of Sciences.*

First West Virginia Record for the Sanderling.—While walking along the Buckhannon River near Tennerton, Upshur County, West Virginia, on September 22, 1933, my attention was attracted to a flock of very light-colored Sandpipers. When observed with the glasses, they proved to be Sanderlings (*Crocethia alba*), and, so far as I know, constitute the first record of this bird for the state.

There were four birds in the flock, feeding along the water's edge in quite a different manner from their usual habit near breaking waves. No facilities were at hand for collecting a specimen, but I am thoroughly familiar with the bird on the Atlantic coast, and feel that this identification is positive. The abundance of white was unmistakable, particularly as the birds were seen at close range with 6x glasses.—MAURICE BROOKS, *French Creek, W. Va.*

Shorebird Migration in Barbados.—A much larger number of North American shore-birds than usual were driven by stormy weather to take shelter on Barbados during the autumn migration of 1933. Among them I was able to identify two species that are quite rare here—a few Knots (*Calidris canutus rufus*) and a Hudsonian Godwit (*Limosa haemastica*).—FRED P. PETERKIN, *Kendal Plantation, St. John, Barbados, B. W. I.*

Oyster-catcher and Western Sandpiper in the British Virgin Islands.—On December 31, 1933 I observed an Oyster-catcher (*Haematopus palliatus palliatus*) on a rocky point of land on Tortola known as Coffy Point. Before I could get within shooting range it took alarm and flew away out of sight.

On December 28, 1933 I collected one of two Western Sandpipers (*Ereunetes mauri*) seen at a brackish water lagoon on Beef Island. It proved to be a female.

Neither of the two species had previously been recorded in the British Virgin Islands.—STUART T. DANFORTH, *College of Agriculture and Mechanic Arts, Mayagüez, Puerto Rico.*

Parasitic Jaeger (Stercorarius parasiticus) in Wisconsin.—A living specimen of this bird was picked up on McKinley Beach, Lake Michigan, near Milwaukee. Its wing was broken and it was killed by its finder before being turned over to the Museum where its skin is now preserved. It is a female in immature plumage and was identified by Dr. Robert C. Murphy of the American Museum of Natural History, New York City. It measured 17.5 in. in length; wing spread, 41.5 in. and wing 12.5 in. and weighed 12 oz.—WALTER J. MUELLER, *Assistant Dept. Zoology, Milwaukee Public Museum.*

Occurrence of the Pomarine Jaeger in North Carolina.—On October 18, 1933, an immature male specimen of Pomarine Jaeger (*Stercorarius pomarinus*) was taken on the beach near Ocracoke, N. C., while feeding on the body of a Ring-billed Gull.

A recently-healed wound in the breast muscles of the specimen seemed to have originally been about one and one-half inches deep and nearly an inch in diameter, and this was, no doubt, responsible for the rather emaciated condition of the bird. A recent molt seemed to be about completed.

So far as I have been able to ascertain, this is the first record—supported by a specimen—of the Pomarine Jaeger in North Carolina. Mr. A. C.

Bent, on page 13 of 'Life Histories of North American Gulls and Terns,' 1921, mentions this state in his list of spring arrival dates as, "North Carolina, Cape Hatteras, April 18," but a recent search through his original data, now in the Bureau of Biological Survey, by Mr. Frederick C. Lincoln, failed to disclose this record.—H. H. Brimley, *State Museum, Raleigh, N. C.*

A Curious Habit of Gulls.[1]—On September 24, 1933, a flock of Herring Gulls (*Larus argentatus smithsonianus*) had congregated at the eastern end of Fairfield Beach, Fairfield, Conn., the tide being nearly out. The location is near the mouth of a creek and the currents of water change the contour of the shore line from year to year. This year a small sand islet is exposed at low tide leaving a shallow strip of water about thirty feet wide between it and the shore.

Many of the Gulls were standing in this shallow water and, as I approached, I noticed a curious rhythmical splashing sound, like *slop-slop-slop-slop* continuing indefinitely. Observation showed that a dozen or more of the Gulls were producing the sound by moving their feet up and down as though marking time. The several birds kept well together in the movement so that it rather suggested a dance. Now and then one of them would cease its movements, or another one begin them, but some of the birds were performing all of the ten or fifteen minutes that I watched them. I timed them and found that there were regularly thirty-two foot movements in five seconds, or sixteen with each foot.

Most of the birds engaged in this movement seemed to be looking about indifferently, but once one of them suddenly ceased and darted its bill into the mud and water at its feet, evidently obtaining something edible, though just what I could not determine.

On several other occasions this fall I observed the same thing at this place, when the tide was low, and on November 9, noted Laughing Gulls (*Larus atricilla*) with the Herring Gulls, also indulging in the habit. I failed to note this performance at any other point along the coast where Gulls feed at low tide and I find no reference to the habit in the literature at my disposal. Dr. Witmer Stone, however, tells me that the habit has been recorded by several English writers.

I am inclined to think that the birds were attempting to stir up some edible creatures that were hiding in the mud, perhaps marine worms; and that conditions at this particular spot made such a habit useful to them.—Aretas A. Saunders, *48 Longview Ave., Fairfield, Conn.*

A Key to the Owls of the Genus Pulsatrix Kaup.—Owing chiefly, no doubt, to paucity of material, species of the genus *Pulsatrix* have been much confused in ornithological literature. A key to the species and subspecies is here given in the hope that it will be of use to workers in the museum and field.

[1] Published with the aid of the Dwight Memorial Fund. Cf. also Condor, 1934, p. 32. [Ed.]

a. Larger, wing more than 325 mm.; toes feathered to near the claws; primaries and tail not distinctly barred with whitish or buffy; tail less than three-fifths the length of wing; culmen rounded.
(Subgenus *Pulsatrix* Kaup.)

b. Head and hind neck chocolate brown, not darker than back; superciliary line not pure white; not extending beyond eye; lores not pure white; only a touch of white on foreneck; toes with only two scales of equal breadth at base of nails; tail always more than 198 mm. long. (Santa Catharina, Brazil, to Chaco, Paraguay.)
Pulsatrix pulsatrix (Wied.)

b′. Head and hind neck sooty or blackish brown, darker than back; superciliary line pure white, extending beyond eye and down around edge of facial rim to sides of neck; large patch of white covering foreneck and extending around to sides of neck; toes with three scales of equal breadth at base of nails; tail usually less than 198 mm. long. (Oaxaca, Mexico, to northern Argentina.)
Pulsatrix perspicillata (Latham).

c. Smaller, wing averaging less than 335 mm.; lower breast and abdomen very light whitish or ochraceous buff; lower hind neck and back not sooty or blackish.

d. Crown blackish; hind neck dusky or grayish brown; abdomen moderately light buffy. (Venezuela to the Guianas, Matto Grosso, Brazil, and eastern Ecuador.)
Pulsatrix perspicillata perspicillata (Latham).

d′. Crown dusky or light brown; hind neck light brown; abdomen very light buffy. (Island of Trinidad, off Venezuela.)
Pulsatrix perspicillata trinitatis Bangs and Penard.

c′. Larger, wing averaging more than 335 mm.; lower breast and abdomen deep buff; lower hind neck and back sooty blackish, as dark as the crown.

e. Lower breast, and abdomen, and sometimes the legs, more or less barred with sooty blackish. (Oaxaca, Mexico, to Costa Rica and Pacific Coast of western Panama.)
Pulsatrix perspicillata saturata Ridgway.

e′. Lower breast, abdomen, and legs not barred with sooty blackish.

f. Upper parts and sides of face deeper sooty black; longest feathers of sides of female less than 145 mm. long; abdomen very deep buff. (Escazu, Costa Rica and Caribbean slope of eastern Panama through Colombia to western Ecuador.)
Pulsatrix perspicillata chapmani Griscom.

f′. Upper parts and sides of face lighter, more of a grayish sooty black; abdomen moderately deep tawny buff;

longest feathers of sides of female more than 150 mm. long. (Southern Bolivia and northern Argentina.)

Pulsatrix perspicillata boliviana[1] Kelso.

a'. Smaller, wing less than 320 mm.; toes bare; primaries and tail distinctly barred with whitish or buffy; tail more than three fifths the length of wing; culmen acutish. (Subgenus *Novipulsatrix* Kelso.)[1]

g. Lores and superciliary stripe almost or quite pure white; ground color of lower breast and abdomen white, with regular bars of dark brown bordered with blackish on their upper side; wing less than 290 mm. (Eastern Ecuador to eastern Peru.)

Pulsatrix melanonota (Tschudi).

g'. Lores and superciliary stripe buff to deep orange buff; ground color of lower breast and abdomen deep buff or tawny buff, with irregular and indistinct bars of dusky not bordered with black on their upper side; wing more than 290 mm. (Esperitu Santo and Rio de Janeiro, Brazil, to Chaco, Paraguay, and Misiones, Argentina.)

Pulsatrix koeniswaldiana (Bertoni).

—Leon Kelso, *Washington, D. C.*

Owls on a Louisiana Highway.—On October 1, 1933, while riding down the new "Air-Line Highway" from New Orleans to Baton Rouge, Louisiana, I noticed a large Owl lying dead on the highway. I stopped and found that it was a Great Horned Owl (*Bubo v. virginianus*), evidently struck and killed by an automobile. I had gone scarcely a hundred yards farther when I found another of the same species, and then another. I was passing through a big swamp near New Orleans, and the road seemed literally lined with dead Owls. On the ten mile stretch of highway through the swamp, I counted no less than seventeen large Owls, lying dead by the road side. I examined several, and found two species, Great Horned Owls and Southern Barred Owls (*Strix varia alleni*).

This highway had only been open a few weeks, and evidently the big Owls living in the depths of the swamp were bewildered and blinded by the lights of the automobiles. The rest of the inhabitants of the swamp seemed to fare better, for the only other bird seen dead on the road between New Orleans and Baton Rouge was a Southern Blue Jay.—William B. Ward, *Timmonsville, S. C.*

The Saw-whet Owl in Oklahoma.—On November 29, 1933, the Museum of Birds and Mammals received, in the flesh, an adult female Saw-whet Owl (*Cryptoglaux acadica acadica*) collected near Eva, Texas County, Oklahoma, by Miss Eleanor Henderson.

Texas County is the central one of three counties in the narrow strip of land between Kansas and Texas. It is an arid region, with no timber except a few scrubby trees along the watercourses. Since the bird was in too poor condition to skin, it was prepared as a skeleton.

[1] Biological leaflet No. 1, July 25, 1933, p. 1.

Mrs. Nice in her 'Birds of Oklahoma' did not include it but in the fourth edition of the A. O. U. 'Check-List' Oklahoma is included in the range of the species.

I wish to express my thanks to Mr. C. D. Bunker, Assistant Curator in Charge, of the Museum of Birds and Mammals, for permission to report this record.—W. S. Long, *Museum of Birds and Mammals, Lawrence, Kansas.*

Saw-whet Owl in North Carolina.—On December 15, 1933, in Onslow County, N. C., I picked up a dead specimen of Saw-whet Owl (*Cryptoglaux acadica acadica*) floating in Duck Creek. The body was much emaciated but seemed perfectly fresh. This is our first record of this species in North Carolina since 1910.—H. H. Brimley, *State Museum, Raleigh, N. C.*

Arkansas Kingbird on Nantucket, Mass.—On the afternoon of September 13, 1933, a full plumaged adult Arkansas Kingbird (*Tyrannus verticalis*) was seen at close range at Nantucket, on the road to Sisco. Perched on a fence post not far from farm buildings it flew from post to post and once across the road close to the observers so that the stereo-binocular glasses were hardly necessary to make out every detail of marking and coloration. After fifteen to twenty minutes the bird took wing flying over an open field and disappeared. So far as I am aware this is the first record of the species for the island of Nantucket.

Miss Grace Wyatt and Dr. and Mrs. Herbert E. Walter made up the party of observers.—Alice Hall Walter, *67 Oriole Ave., Providence, R. I.*

Unusual Actions of a Phoebe (Sayornis phoebe).—On November 27 I was on a deer stand in Onslow County, N. C. The air was rather warm for the time of year and mosquitoes were quite noticeably in evidence, though not particularly aggressive. I was in a standing position with my rifle under my arm, the barrel pointing downward, and I had my hands clasped in front. A faint fluttering of wings caused me to look down, and I saw a Phoebe (*Sayornis phoebe*), a bird frequently known by us as Winter Pewee, trying to alight on my rifle barrel. Failing to secure a firm grip on the smooth surface of the metal, the bird slid down the barrel until the front sight was reached, where it secured the grip desired, and there it perched.

It showed no sign of fear or nervousness and in a few seconds flew up and picked a mosquito off my hands, which were not more than a foot distant from its perch. Then, it picked others off the front of my coat, off my sleeves, and several more off my hands, meanwhile perching indiscriminately on my hands, sleeves, and gun barrel, though seeming to prefer the last.

Finally, the Phoebe discovered that my face seemed to be attracting more mosquitoes than any other part of my person so he transferred his attention to that part of my anatomy, and found a new perching place on the top of my hunting cap.

In picking mosquitoes off my face, the sharp points of the bird's bill were noticeably felt at every capture, and it was the irritation caused by a succession of these pricks that finally caused me to dispense with its attentions. Mosquitoes were also taken by the bird off the back of my neck and my left ear, but none from the right ear.

I counted twenty times that the Phoebe perched on my rifle and twenty catches of mosquitoes taken off my face, and then stopped counting. I estimated that the number of separate perchings on the gun barrel reached at least forty, the mosquitoes taken off my face between thirty-five and forty, and that the total number of those insects taken off my person numbered sixty or seventy altogether.

When I decided to end the incident, I found a difficulty in doing so. I had presumed that any decided movement on my part would drive my little friend away, but this bird was not of the scary kind. He had learned that I was the community center for mosquitoes in that immediate vicinity, and evidently recognized and appreciated a good eating place when he found one. So he continued to perch on my head and pick mosquitoes off my face even after I had started to move around in an effort to discourage his attentions. But my face was beginning to feel somewhat inflamed from the frequent pecking to which it had been subjected, so I called it a day and told the Phoebe to stop pestering me.

Several times during the Phoebe's visit, it would, after taking a mosquito off my person, perch on a dead branch of a six-foot pine sapling about four feet distant from where I was standing. Once, while it was occupying this branch, I slowly stretched out my arm towards it, with the fore-finger extended to within about one foot of its perch, and it immediately forsook the latter for my finger.

Two days later, a man occupying a stand about a hundred and fifty yards distant from where the above-described incidents occurred, related that a small bird had approached him, perched on various parts of his body, and every now and then fluttered directly in front of his face. But that morning was cold, with no mosquitoes in evidence.

Subsequent to this, three other deer hunters occupying the same or near-by stands reported intimate visits from a small, dull-colored bird, and it would seem to be fairly safe to presume that it was the same individual Phoebe in all five cases.

The above took place in a wild section of the lower part of Onslow County, North Carolina, with no residence or cleared land near by. It is quite possible that this individual Phoebe had never seen a human before and, finding that the object around which the mosquitoes collected was no more dangerous than any other stump in the woods, even if it did possess the power of movement, mentally included me as just one more object properly belonging in the landscape.

My outer dress on that morning was khaki-colored cap and coat and dark corduroy breeches.—H. H. Brimley, *N. C. State Museum, Raleigh, N. C.*

Prairie Horned Larks Perching in Trees.—In Mr. Gale B. Pickwell's study, 'The Prairie Horned Lark' (Trans. St. Louis Acad. Sci., XXVII, 1931), although he has quoted generously from my paper (Auk, XXXIII, pp. 281–286) he has omitted my probable unique experience in having watched a pair of these Larks when bringing food to their young, and always first perching in a tree. I have yet to find a reference to these Larks perching in trees at all, and all the text books state definitely, that they never perch in trees. Mr. Pickwell says (p. 69) that I have not made it clear just how I located a certain nest at its very beginning. On reference to my paper, I find that in order to discover just when the "paving" to these nests is added, I "lifted" a recently laid set of eggs from a nest about 240 yards from my bungalow, on April 14, 1915. At the back of this nest the ground rose somewhat abruptly into a ridge, behind which, it was easy for me on the following day to lie concealed and watch the female commence the scrape for the second nest, which was finished at 4.30 p. m., as stated in the table of events recording the times at which the paving to this nest was put in place, also, the laying of the eggs.—Henry Mousley, *4073 Tupper Street, Montreal.*

The "Phoebe" Call of the Chickadee.—From childhood I have imitated the "phoebe" call of the Oregon Chickadee. I never took notes on the call, but mentally associated it with spring and summer and cannot recall ever hearing it in the winter.

After reading in 'Bird Song' by Aretas A. Saunders that the Chickadee uses this call at all seasons, I began to make a careful check on the Black-capped Chickadees (*Penthestes a. septentrionalis*) of Montana. For two winters, 1931–32, 1932–33, I carefully listened for the birds to voluntarily give this call and then attempted to coax it from them by whistling the notes. They have usually showed signs of interest and possibly a little excitement when I have whistled, but have never answered. On November 12, 1933, I at last inveigled one bird to whistle "phoebe" a few times. This was my only winter record. During the spring and summer, the poorest imitation of "phoebe" will excite the entire flock to a concerted "phoebe" chorus. From these observations I had concluded that in the West the notes are used almost exclusively in the spring and summer.

The winter of 1933–34, however, presented unusual conditions and during January until time of writing (February 14) the Missouri River has been free from ice, butterflies are flying, gophers are running over the prairie and the Chickadees are whistling "phoebe"! I can only account for this by the spring-like weather.

I have never heard the Chestnut-backed Chickadee (*P. r. rufescens*) sing the "phoebe" call or give any notes resembling it. During the summer of 1933 I was in daily contact with this species in the San Juan Islands, yet never was able to attract the slightest attention by whistling this call. While the birds sing the common "chickadee-dee-dee" and give other undescribable twitterings, I failed to hear anything that could be interpreted as "phoebe."

The Mountain Chickadee (*P. g. gambeli*) has a variation to the call. During the spring of 1933 I spent two days in the Dearborn Mountains, Montana, and had the opportunity of hearing and recording its songs. In the cottonwoods and low bushes growing along the river bottom of the Dearborn River several flocks of Black-capped Chickadees were observed. I recorded their "phoebe" song with the stop watch and pitch pipe and found it identical with the calls heard elsewhere. High up on the hills in a scattering growth of pine, I found the Mountain Chickadees. All seemed to be whistling their peculiar variation of "phoebe." Both the pitch of the song and the quality of the voice are different from those of the Black-cap. It had been comparatively easy to whistle the notes of the Black-cap, but I found the Mountain Chickadee was three full steps higher, making it necessary to use a tooth whistle in imitating. The voice has a harsh rasping quality unlike the clear whistle of other Chickadees. The notes are all given on the same pitch, the first note so short it appears as a grace note, followed by the two longer notes. The birds answered my calling, but I noticed a lack of the inquisitiveness characteristic of the Black-caps.

While descending from the hills, I found a flock of Black-caps about half way up the hill side in the bushes of a small canyon. A member of this flock confirmed Saunders' findings that birds learn new songs by imitation,[1] for this bird was adding part of the Mountain Chickadee's notes to his own. The pitch and voice were those of the Black-cap but the first part of the call was identical to the Mountain Chickadee. Without a doubt this flock of birds often associated with the Mountain Chickadees and in so doing this bird imitated their call, adding his own notes to the end.—Ellsworth D. Lumley, *Great Falls High School, Great Falls, Mont.*

A Melanistic Black-capped Chickadee.—While walking near Ithaca, New York, on October 29, 1933, I noted that one individual of a fair-sized flock of Chickadees (*Penthestes a. atricapillus*), had a totally black head. The following day I returned and collected the bird, which proved to be a male in good condition. The specimen was made into a skin (Cornell University Museum No. 4955).

Description: Entire head, including the cheeks, black, less glossy apparently than on the crown of normally colored individuals, this black extending onto the upper back and breast considerably farther than in normal specimens, invading even the median region of the belly; rest of plumage dark throughout: the back a little darker than normal, the belly and flanks much darker and washed with brown, the wing-coverts, primaries, secondaries, and rectrices edged with gray rather than whitish. The measurements are those of an average adult male.

So far as I could determine the behavior and call notes of the melanistic individual were normal, and all other birds of the flock appeared to be normal in coloration. I have found but one other record for melanism in the Paridae; two melanistic individuals of the Coal-titmouse, *Parus ater*, were observed in a flock in England (British Birds, I, p. 384).—James T. Tanner, *Laboratory of Ornithology, Cornell University, Ithaca, New York.*

[1] But cf. Allen *antea* bottom of p. 184, and others. [Ed.]

Bicknell's Thrush (Hylocichla minima minima) in Georgia.—Although known to migrate through the southeastern states, only one definite specimen of this form seems to have been secured in this state. On September 6, 1933, Mr. D. V. Hembree collected a male bird in northern Fulton County, about eighteen miles north of Atlanta. Also three days later, he collected a male Gray-cheeked Thrush (*Hylocichla minima aliciae*) at the same location. Both of these specimens were sent by me to the Bureau of Biological Survey and identified by Dr. Harry C. Oberholser. On October 3, 1931, while on a hiking trip up Mt. Enota in northern Georgia with a party of enthusiastic bird students, I carefully examined, measured, and recorded an injured Thrush which was caught by Miss Berma Jarrard and later released. We are satisfied that this bird was a Bicknell's Thrush. There are several records of the Gray-cheeked Thrush from Georgia including four specimens in the Emory University Museum, all verified. Also a bird was found dead near Atlanta on September 25, 1927 which was verified as *aliciae*. However the bird secured by Mr. Hembree as stated above seems to be the only specimen of *minima* taken in Georgia.—Earle R. Greene, *Atlanta, Ga.*

Bicknell's Thrush Taken Near Toledo, Ohio.—On September 29, 1933, a male Bicknell's Thrush (*Hylocichla m. minima*) was collected along Swan Creek about ten miles south of the city limits of Toledo near the village of Monclova, Ohio. The skin, prepared by Bernard R. Campbell, is now No. 6561 in the Ohio State Museum collection. Identification was verified by Dr. H. C. Oberholser. As far as we have been able to ascertain, this is the first record for this form for the state of Ohio.—Louis W. Campbell, *Toledo, Ohio.*

Gray-cheeked Thrush in West Virginia.—I am informed by Mr. A. B. Brooks, naturalist at Oglebay Park, Wheeling, W. Va., that he had under observation during April, 1933, a crippled specimen of Gray-cheeked Thursh (*Hylocichla minima aliciae*). Careful measurements were made to check the identification, and the specimen was preserved. On October 16, 1933, Mr. Brooks and myself observed near French Creek, W. Va., an individual referable to this species, or to *H. m. minima*. Since the record was made in the field, there was no means of determining positively which sub-species we had.

The only previous record for the Gray-cheeked Thrush in West Virginia was made by Mr. I. H. Johnson. Both this and Bicknell's Thrush doubtless occur much more commonly than observations would indicate.—Maurice Brooks, *French Creek, W. Va.*

Notes on a Red-eyed Vireo's Nest.—*July 6, 1933;* Found: two pieces of tangled ravellings hanging from fork on a beech branch four feet from the ground. It appears like the starting of a nest. The beech stands very near the road and directly in front of the cottage. A pair of Wrens have a home in the next beech a few feet away.

July 8: We have decided it is a nest, for there are a few more ravellings hanging down a foot or so.

July 9, 1933: Late afternoon: We saw both Red-eyed Vireos (*Vireo olivaceus*) working at the nest. The bunches of untidy ravelling hang lower, but there is no bottom to the nest. Birds are absolutely silent.

July 10: Some loose network may be seen forming a bottom to the nest. Several bits of birch bark have been skillfully intertwined on the outside. Both birds work. The ravellings are mostly caught up.

July 11, 6 A.M.: Saw one bird pull a small, short strand of bark from a dead oak twig. He carried it to the nest and was back for another in four minutes. Strangely enough he tried to pull bark from several live twigs before he again found a dead one and got the bark. Same thing was repeated several times. No singing, which is strange when one realizes how talkative Red-eyes usually are. At the end of the day the nest appeared finished. All loose ravellings had been caught up and fastened. A piece of paper ¾ x 1½ inches in size is spread across the floor of the nest inside.

7.30 P. M.: Heard strange clicking noise, something like fingernails snapping together. A male Redstart was snapping his bill at a female Cowbird (*Molothrus a. ater*) in the underbrush at left of cottage. The Cowbird appeared quite unconcerned. It moved on a few feet, and so did the Redstart, snap-snapping continually. The Cowbird continued to move, ever toward the Vireo's nest. The Redstart kept about four feet behind her. The Cowbird's movements were very deliberate almost slinking. There was no sound. From bush to bush it went into the oak tree, which stands in front of cottage. Across that it advanced step by step with the Redstart in close pursuit. Suddenly it darted from the oak tree, swept down toward the ground exactly beneath the Vireo's nest and then up into the beech above the nest. Instantly the Redstart was after it and also both Vireos—perfectly silent. The Cowbird disappeared. The Wren, usually such an ardent defender of all branches near his nest, paid no attention whatsoever to this Cowbird. I wondered if he considers it no enemy since it can not enter the hole to lay an egg there. Vireos went across the road after the Cowbird left and "hissed" for quite a time, then they returned to a dead branch a few feet above their nest and sat there about six inches apart for so long I tired of watching them.

July 12: 9.15 A. M.: I saw the Cowbird settling herself on the nest, so I called and scared her off. All day long the male Vireo sang in the tree near by, but never approached the nest. No eggs ever laid in it. The birds simply abandoned it.—Minna Anthony Common, *Thousand Island Park, N. Y.*

Lawrence's Warbler in Delaware.—On the afternoon of May 6, 1932, I was on the edge of a small woods near Wilmington, Delaware, engaged in watching a Warbler migration in full swing. I spied one diminutive bird busily moving about which was a new acquaintance for me, and watched it with binoculars carefully noting down its characteristics.

The next day, after referring to Forbush and others, I felt sure that the bird had been a Lawrence's Warbler (*Vermivora lawrencei*). Through my binoculars I had been able to distinguish clearly all of its characteristics: crown and sides of head bright yellow except for a black line through the eye, throat black, breast and belly bright yellow, wings and tail bluish, under tail-coverts white. There had been, however, one yellow wing-bar instead of the two white ones as in the typical *V. lawrencei*. Either the specimen was a hybrid more closely resembling *V. chrysoptera* or I had been deceived by its activity among the yellowish, budding oak leaves. As I observed it very carefully, I consider that the former is more probable.

As nearly as I can discover from available literature and from the records of the Natural History Society of Delaware, this is the first record of Lawrence's Warbler for Delaware. Mr. C. J. Pennock had placed the bird on the society's hypothetical list as of probable, but unrecorded, occurrence in the state.—J. Willcox Brown, *Montchanin, Delaware.*

A Hybrid in the Genus Dendroica.—Hybrids in the genus *Dendroica* seem to be very rare. There is in the University of Michigan Museum of Zoology a skin which is evidently a hybrid *Dendroica striata* × *Dendroica castanea*. The bird in question, No. 53692, is a male taken at Warren Dunes, Berrien County, Michigan, May 19, 1920, by Norman A. Wood. It is similar to *D. striata*, but differs from the latter species in the following particulars: malar region and chin black, with only the anterior half of the interramal region and a spot one or two millimeters in length at the end of the rami white; black streaks on the sides of throat coalescent, leaving a white line in the center of the throat only one to two mm. broad; chin, malar region, sides of neck, sides, and flanks more or less marked with bay; suborbital, auricular, and postauricular regions, as well as breast, pale cream buff; the abdomen, sides, flanks, and under tail-coverts also somewhat suffused with this color. The bird has the following measurements: wing (flat), 73 mm.; tail, 49; tarsus, 18.5; exposed culmen, 10.5; middle toe, 11.2.

W. P. Taylor (Univ. Calif. Publ. Zool., VII, 173–177) has already reported an apparent hybrid *Dendroica coronata* × *D. auduboni*. It will be noted that in both of these cases the crossing has been between very closely related species.—Pierce Brodkorb, *Museum of Zoology, Ann Arbor, Michigan.*

The Juvenal Plumage of Townsend's Warbler (Dendroica townsendi).—Apparently there is no description of the juvenal plumage of Townsend's Warbler. Two specimens were collected by the writer at Masset, Queen Charlotte Islands, in July, 1920. No. 6809, female juvenal, July 7, 1920, presents the following characters. Upper surface brownish olive, greener on dorsum and grayer on crown; lores and auriculars dusky brown, a broad supercilium and malar stripe whitish, faintly tinged with yellow; chin and throat dusky olive gray passing into white on the ventral

region and crissum, the flanks and breast streaked with dusky; wings with two white bars formed by the tips of the greater and lesser coverts, tertials edged with ash gray, the black central shafts of the white bars seen in the second (first winter) plumage are barely indicated; tail as in second plumage.

Bill blackish, whitish flesh along the cutting edge and base of lower mandible; tarsi brown, feet and claws brownish yellow, soles yellow.

Compared with the juvenal plumage of *D. virens* the general effect is browner and the stripes on lower surface more diffused while the auriculars are darker and indistinctly bordered posteriorly with buffy. Compared with the juvenal of *D. chrysoparia* these differences are more pronounced, the latter being grayer with a darker throat.

In this individual (No. 6809) a few yellow feathers of the second plumage are appearing while another juvenal collected a few days earlier, sex not determinable, had only just left the nest with tail about one third grown. It is in every way similar to the bird described except that there are no feathers of the second plumage in evidence. As in most of the Compsothlypidae the juvenal plumage is only complete for a few days after leaving the nest which accounts for the scarcity of this plumage in collections.—Allan Brooks, *Comox, B. C.*

The Mourning Warbler in Maryland.—On the afternoon of May 7, 1932, I heard an unfamiliar song in a tree on the lawn of a cottage on Oldfield Point, Elk River, Md. On my approach the bird flew to a horse chestnut tree several hundred feet away where he resumed his song. As he perched on the topmost branch and uttered his beautiful, liquid warble, I was able to get close enough to see him very distinctly through a pair of 8 x binoculars. His decidedly black throat and upper breast contrasting sharply with his yellow belly and gray head and cheeks convinced me that he was a Mourning Warbler (*Oporornis philadelphia*). With his head thrown back in song the black on his breast did not appear as extensive as in most illustrations. When I tried to get a closer view of him, he flew to a maple tree in another yard and from there into a dense ravine where I was unable to rediscover him.

I had seen the Mourning Warbler only once before. On May 11, 1930, I saw a handsome male singing on an electric wire on Oldfield Point within a quarter of a mile of my second observation. When I came within about fifty feet of him, he disappeared into the same ravine in which my second Warbler took refuge two years later. The observation of this species twice in three years in such a limited area may possibly indicate that the Mourning Warbler is a more regular migrant in this part of the country than is generally believed.—J. Willcox Brown, *Montchanin, Del.*

The Hoary Redpoll in Ohio.—On March 16, 1931, the writer, while accompanied by Mr. Robert H. McCormick, collected a Hoary Redpoll (*Acanthis hornemanni exilipes*) at Little Cedar Point, Lucas County, Ohio.

The bird was engaged in feeding in several weedy patches along the margin of an extensive marsh area, a half mile south of the Lake Erie shore. This individual was exceedingly active, darting rapidly back and forth between weedy patches and several fence posts or mounting to some telephone wires or tree tops to emit repeatedly from three to five rapid indescribable notes which recalled at the same time those of both the Purple Finch and the Goldfinch. On March 29, 1931, another solitary individual was observed for a few minutes in the same locality.

The specimen, when first reported (Auk, XLIV, p. 229), was referred to *Acanthis linaria linaria*. Collections of the latter species received recently by the Ohio State Museum, made obvious the fact that a mistake had been made. The re-determination as a Hoary Redpoll (*Acanthis hornemanni exilipes*) has recently been verified by Dr. H. C. Oberholser. The species has not previously been recorded for Ohio. The specimen, a male, measured as follows:—length 128 mm., wing 72 mm., tail 58 mm., tarsus 15 mm., and was in excellent condition. The skin is now No. 3807 in the Wheaton Club collection of the Ohio State Museum.—Lawrence E. Hicks, *Department of Botany, Ohio State University, Columbus, Ohio.*

Gambel's and Harris's Sparrows in Tennessee.—At my home banding station, Blossomdell, located in the suburbs of Nashville, Tennessee, there were 101 White-crowned Sparrows banded in the period between February, 1932, and December, 1933. Two of these have been identified as Gambel's Sparrows (*Zonotrichia leucophrys gambeli*). The first individual, trapped in February, 1932, was in adult plumage but after banding was released. This bird No. B 176049 was recaptured January 21, 1933; was then identified by me as *gambeli*, but it was released without verification. On November 23, 1933, the second bird of this sub-species, an immature, was taken in a trap and collected as apparently this race had not yet been recorded in Tennessee. The specimen was sent to the Bureau of Biological Survey, Washington, D. C., and identified by Mr. F. C. Lincoln as typical of the race *gambeli*. On February 20, 1934, No. B 176049 was again captured and before releasing, the identification was verified by Mr. A. F. Ganier. As it was in full adult plumage when first taken, it is now at least in its fourth year of age. In size it was noticeably smaller than a *leucophrys* in the trap simultaneously. Wings measured 3.12; tail 2.78; bill .42, distinctly yellowish in color. The bird appeared to be in splendid physical condition.

Another very interesting capture was made on December 10, 1933, when, with three Field Sparrows, a Harris's Sparrow (*Zonotrichia querula*) was taken in a simple type of top opening trap baited with millet and sunflower seeds. This bird, an immature male, was collected and the identification verified by Mr. Lincoln. This likewise constitutes a first known record of this species in Tennessee.

The body of the Harris's Sparrow was examined for internal parasites by Dr. Paul D. Harwood of Vanderbilt University, Nashville. He reports

finding in the intestinal tract two spiny headed worms of the genus *Mediorhynchus* Van Cleave, measuring 30 and 32 mm. in length and of a species not heretofore described.—Mrs. Amelia R. Laskey, *Graybar Lane, Nashville, Tennessee.*

Notes from the Connecticut Valley in Massachusetts.—*Nyctanassa v. violacea.* Yellow-crowned Night Heron.—This species was unusually common on the Massachusetts coast in August–September, 1933, and for the first time was recorded in the western part of the state. One in second-year plumage was discovered at Northampton on September 12 and remained through the month, being particularly well seen on September 23.

Rallus e. elegans. King Rail.—A brief but unmistakable glimpse of one flying over a bush in mid-marsh was obtained in Northampton on September 13, and in the following ten days several other observers heard or saw it.

Pluvialis d. dominica. Golden Plover.—Early on October 5 one was heard calling and seen to descend to a flock of Killdeers at a rain-pool in Hadley. Twenty-four hours later it was seen to depart thence southward. Our only recent prior record was of one seen, again with Killdeers, in the same town on August 31, 1931.

Squatarola squatarola. Black-bellied Plover.—On the very cold morning of October 26, when all standing water was frozen, one was found on a plowed field in Hadley. It had a small bill, hardly at all swollen towards the tip, and seemed very immature, but was absolutely identified by leg-color, axillars, and flight note.

Pisobia bairdi. Baird's Sandpiper.—Following the Berkshire County examples reported in the January 'Auk,' the first ever found in our valley was identified at Hadley on October 1.

Pelidna alpina sakhalina. Red-backed Sandpiper.—At least four, one of them in rufous, summer-like plumage, were noted in Hadley, October 22–29, inclusive. Our only prior record in this century was of one in Holyoke, October 16–17, 1932.

Coccyzus a. americanus. Yellow-billed Cuckoo.—A very late example of this species, hereabouts always unusual, was identified in Hadley on October 18 by Miss Fannie A. Stebbins.

Nyctea nyctea. Snowy Owl.—An unusually early bird spent three hours of November 9 in a spruce on top of Round Hill, Northampton. A big flight was expected, but did not arrive.

Chordeiles m. minor. Eastern Nighthawk.—A very late straggler was noted at Pittsfield on September 23.

Picoides arcticus. Arctic Three-toed Woodpecker.—A male in Easthampton on September 24 (a strikingly early date) was discovered by John Treadway and confirmed by A. C. Bagg.—S. A. Eliot, Jr., *Northampton, Mass.* and Aaron C. Bagg, *Holyoke, Mass.*

Rare Birds on Block Island, Rhode Island.—*Fregata magnificens.* MAN-O'-WAR-BIRD.—On November 16, 1932, two of my former bird-study pupils brought me a beautiful female Man-o'-war-bird which had been dead only a few hours. It had been shot and left on one of the fishing wharves at Old Harbor, Block Island, R. I., where my friends found it. It has been mounted by Angell and Cash and is now in our Block Island School collection of birds.

Vanellus vanellus. LAPWING.—On November 20, 1932, one of my High School girls brought me a fine specimen of a Lapwing which had been shot on Block Island. It had passed through many hands before it was salvaged by my little friend. It has been mounted and is now in the School collection.

Chen hyperboreus atlanticus. GREATER SNOW GOOSE.—One of these Geese was shot on the morning of October 27, 1933, at Sandy Point, Block Island, and was secured by a High School boy for the School collection. It is now being mounted.—ELIZABETH DICKENS, *Bird-Study Teacher, Block Island Schools.*

Notes from Eastern Long Island.—These notes are offered as a sort of continuation of a similar series presented in 'The Auk' of October, 1930, and begin where the others left off, carrying them on to the date of January 1, 1934. Again the author has tried to include items of general, rather than local, interest.

Fulmarus glacialis glacialis. ATLANTIC FULMAR.—On October 3, 1930, a Fulmar was seen flying over the beech at Mecox Bay. It flapped and soared alternately, and frequently threw back its head with bill widely agape, and this unnatural behavior persuaded me that the bird was either sick or injured. Eventually it lit upon the surface of the ocean, but it passed me once at a distance of no more then eighty yards, and I recognized it clearly by its characteristic shape, gull-like coloration, stiff, straight wings, short, stout, hooked bill, and the triangular pale patch on the dorsum of each wing. I had not seen Fulmars since 1918, but knew the bird at once. I believe this to be the first record of the Fulmar for New York state, but since it is but a sight record, it may not receive full scientific recognition.

Phalacrocorax carbo carbo. EUROPEAN CORMORANT.—On September 19, 1924, I noticed that two Cormorants among others perched on stakes in Gardiner's Bay were larger, and were almost pure white on the belly, breast, and about the throat. It became later apparent that this sort of Cormorant was not unusual, and became more numerous as the year advanced, until it reached the height of its abundance in mid-October; falling off in numbers thereafter until only stragglers were left by early December. Since 1924, I have seen these birds in the fall of every year. In October 1933, a bird of this sort was found dead at Easthampton, and proved to be the European Cormorant. Its carcase, incidentally, had a peculiar, musty, almost aromatic odor, similar to the odor of many Tubi-

nares, and which I have never noticed in Double-crested Cormorants. Though commonest on Montauk, it is frequently seen among the migrating flocks of Double-crested Cormorants as far west as Quogue.

Casmerodius albus egretta. American Egret.—A spring record of the Egret, in a year when there was no large influx of southern Herons to Long Island is of May 7 and 8, 1932, two birds at Easthampton.

Egretta thula thula. Snowy Egret.—In the years when "white herons" invaded Long Island in numbers, I never found this species. It was the more surprising, therefore, to discover a typical bird at Bridgehampton, on August 25, 1933.

Hydranassa tricolor ruficollis. Louisiana Heron.—An additional record for this species is of May 28, 1933,—one bird, at Easthampton.

Nyctanassa violacea violacea. Yellow-crowned Night Heron.—An immature bird was carefully observed, with Black-crowned Night Herons, at Mecox Bay, August 24, 1932.

Mareca penelope. European Widgeon.—A drake and three presumed ducks were seen at Mecox Bay, with Baldpates, September 21 and 22, 1933.—W. Todd Helmuth.

Notes on West Virginia Water Birds.—Mr. A. Sidney Morgan, for the past thirty years or more, has carefully studied the water birds along the Great Kanawha River, near Winfield, Putnam County, West Virginia. Hundreds of specimens have been collected and mounted by this capable observer and taxidermist. The recorder of these notes has had the privilege of many years of correspondence with Mr. Morgan, and has carefully examined many specimens collected by him. His identifications are dependable and his notes accurate. Mr. Thomas A. Morgan, his older brother, has also made valuable observations and collections of West Virginia water-fowl along the Great Kanawha and at Morgantown, Monongalia County, along the Monongahela River.

The following notes made by the Morgan brothers seem especially worthy of publication since they add much to our knowledge of certain West Virginia birds.

Gavia stellata. Red-throated Loon.—One taken and mounted by A. Sidney Morgan. This specimen was secured on October 25, 1932. The bird, with others apparently of the same species, was with "hundreds of Loons which passed down the river" on the date noted above. The others were evidently Common Loons, though no other determinations were made. This is the first valid record of the Red-throated Loon in West Virignia.

Casmerodius albus egretta. American Egret.—Mr. Morgan says in a letter dated September 5, 1933, "I have observed several White Egrets here in this Kanawha valley. I mean the large kind."

Florida caerulea caerulea. Little Blue Heron.—Mr. Morgan speaks of seeing "a lot of the Little Blue Herons in white phase just this past August."

Nycticorax nycticorax hoactli. BLACK-CROWNED NIGHT HERON.—Of this species he says: "seems to be much more numerous of late years than when I was growing up. I have some fine specimens."

Mycteria americana. WOOD IBIS.—For many years our only record for this species in West Virginia was a somewhat uncertain note printed in a sportsman's magazine a number of years ago. A. Sidney Morgan now has a mounted specimen which was killed by a gunner on Coal River, Kanawha County, in July, 1928. As the bird was freshly killed when it came into the possession of the taxidermist, there can be no doubt that it was taken in West Virginia at the time and place named.

Chen caerulescens. BLUE GOOSE.—A bird of this species was taken by Thomas A. Morgan at Morgantown, Monongalia County, on November 21, 1914. This specimen is now in possession of West Virginia University at Morgantown, and is the only one ever taken in the state so far as records indicate.

Aix sponsa. WOOD DUCK.—A. Sidney Morgan gives an interesting record for this species in the following words: "In the summer of 1927 I found an old Wood Duck with a whole brood of young here at my landing on the Kanawha River. I caught one to make sure, and then let it go. They still had the down on, and evidently had not been hatched more than a few days."

Melanitta deglandi. WHITE-WINGED SCOTER.—In a great flight of water-fowl in late November, 1932, Mr. Morgan observed a number of birds of this species along the Great Kanawha.

Rallus elegans elegans. KING RAIL.—The record runs, "I found a King Rail here in my pond on December 31, 1930. The pond was frozen with three inches of ice, and the bird was lively and active and running on top of the ice. I think this was unusual to find it here that late in the winter and in very cold weather."

Rallus limicola limicola. VIRGINIA RAIL.—In a letter dated September 5, 1933, A. Sidney Morgan says, "I secured the nest and eggs of the Virginia Rail here by the pond about four years ago."

Steganopus tricolor. WILSON'S PHALAROPE.—One was taken by A. Sidney Morgan on the Great Kanawha River in August, 1930. He speaks of seeing several birds of this species in August, 1928. This is the first record of the occurrence of this species in West Virginia.—EARLE A. BROOKS, *166 Plymouth Rd. Newton Highlands, Mass.*

Notes on the Occurrence of Certain Birds in Princess Anne County, Virginia.—At the start of a faunal survey of the coast of North Carolina in the spring of 1932, it was deemed advisable to spend a few days in extreme southeastern Virginia to determine the possible occurrence of certain birds of rather uncertain status in that region. Accordingly, three days, May 17–20, were spent in camp near Pungo, approximately twenty miles southeast of Portsmouth, and the bird life was examined in some detail. Apparently there is still much to be learned of the distribu-

tion of certain species in the southeastern states, for even in this brief time information was obtained that adds materially to our present knowledge of the birds of tidewater Virginia.

Troglodytes aëdon aëdon. EASTERN HOUSE WREN.—In view of the fact that the few breeding records for this species in North Carolina are at Greensboro, Salisbury, and Durham, it was rather a surprise to find it fairly plentiful near Pungo, within twelve miles of the North Carolina line. Four pairs, as evidenced by singing males, were observed and doubtless others were overlooked. In each case they were about houses, and as in several instances the females were likewise seen there is little doubt that they were nesting there.

Telmatodytes palustris waynei. WAYNE'S MARSH WREN.—This subspecies was found to be plentiful, occurring in both fresh and salt water marshes. It was especially numerous in the extensive marshes bordering Back Bay, where males could be heard singing on all sides. Because of the difference of opinion that had existed for some time concerning the form of *palustris* breeding on the North Carolina coast we were especially interested in getting a series of these birds for comparison with other specimens taken farther north and south on the coast. As suspected, they proved similar to the race breeding on the North Carolina coast, recently described by Dingle and Sprunt from a wintering bird taken at Charleston, South Carolina.[1]

Cistothorus stellaris. SHORT-BILLED MARSH WREN.—About half a dozen pairs of these birds were found in an open marsh bordering an inlet near Pungo. The males were singing, and displayed such an interest in the females that were invariably close by that it seemed very probable that they would nest here. As this species is not known to breed south of northern Delaware, it is unfortunate that this supposition could not be established beyond question.

Turdus migratorius achrusterus. SOUTHERN ROBIN.—This species proved to be somewhat scarce here, and while observed at Deep Creek and at Pungo, apparently breeds rather sparingly close to the coast. A breeding bird was collected at Deep Creek.—ARTHUR H. HOWELL and THOMAS D. BURLEIGH, *Biological Survey, Washington, D. C.*

Unusual Birds in South Carolina.—*Cryptoglaux a. acadica.* SAW-WHET OWL.—On November 25, 1933, Miss Caroline Prince presented the Charleston Muesum with a male specimen, in the flesh, of this little Owl. The bird had been found the preceding day, badly injured, in a garage on East Bay Street.

This is apparently the fourth record of capture, and the sixth of occurrence, for South Carolina. Wayne has recorded four occurrences (Birds of South Carolina and Auk, XXVIII, p. 112), and on November 24, 1929, Mr. and Mrs. F. H. Horlbeck and Mrs. Louise S. Barrington reported seeing one at Mt. Pleasant, which was studied at very close range.

[1] Auk, vol. 49, p. 455, October, 1932.

One of Wayne's specimens was sent to Wm. Brewster; and one was destroyed while the third, Richland County bird, is now in the Charleston Museum, along with the present bird (No. 33,384).

Dendroica aestiva rubiginosa. ALASKA YELLOW WARBLER.—On the morning of October 10, 1933, Miss E. B. Richardson, of the Museum staff, found a small yellowish-green Warbler, dead, in the garden of 87 Church Street, this city. Being unable to arrive at a satisfactory identification, the writer sent the specimen to Dr. Alexander Wetmore for determination. He pronounces the bird an Alaska Yellow Warbler (*D. a. rubiginosa*), remarking that "It is marked by dark coloration, in this agreeing with specimens from the coast of Alaska." Dr. H. C. Oberholser who also handled this specimen states that it is not to be confused with *D. a. amnicola* which occurs as far west as eastern Alaska.

This is the first recorded occurrence of this subspecies in South Carolina, and, judging from a check-up of 'The Auk', anywhere east of Brownsville, Texas. The specimen, an immature bird of indeterminate sex, now bears No. 33,318 in our collection.

The writer is indebted to Dr. Wetmore and Dr. Oberholser for their unfailing courtesy in this matter, and to Miss Richardson for the privilage of recording an interesting addition to the birds of this state.—E. B. CHAMBERLAIN, *The Charleston Museum, Charleston, S. C.*

Notes from South Carolina.—*Chen hyperborea atlantica.* GREATER SNOW GOOSE.—On November 26, 1933, a local sportsman shot a bird that was new to him and which proved to be an immature male Greater Snow Goose. It was turned over to the Charleston Museum and is the second record of the capture of the species since the days of Audubon and Bachman, the other recorded by Wayne was shot October 27, 1914. The present bird was one of a flock of six some of which were pure white.

On January 23, 1934, in company with H. C. Oberholser and E. B. Chamberlain the writer saw two of these birds, one in the same rice field in which the above specimen was secured and the other about two miles distant. It is inferred that these were of the same form as the one secured and were probably remnants of the same flock.

Oidemia deglandi. WHITE-WINGED SCOTER.—On January 20, 1934, with the same companions, we saw fifteen of these Scoters in Winyah Bay, off South Island, Georgetown Co., S. C. They flew past our boat at close range in company with many Lesser Scaups and both American and Surf Scoters. Two flocks were seen one of four and the other of eleven. This is the third record for the state, all in January.

Buteo lagopus s. johannis. ROUGH-LEGGED HAWK.—One seen on January 3, 1934 by the writer and Mr. J. Willcox Brown, on rice fields of the Grove Plantation, So. Edisto River, Charleston Co., S. C. It was in the light phase of plumage and hovered in characteristic manner finally dropping straight down into the rank growth for some prey. The white basal half of the tail and the broken band across the belly were diagnostic and we were able to

compare it critically with a nearby *B. borealis*. The writer was with Mr. Arthur T. Wayne and with Mr. Herbert R. Sass when the previous state records were made.

Pagolla wilsonia wilsonia. Wilson's Plover.—In company with Mr. J. Willcox Brown the writer saw an individual of this species on the beach of Big Bay Island, S. C. on January 3, 1934. It was standing on the exposed mud formations hunched up as if from the cold, as there was a raw north-east wind with temperature at 40°. We studied it with binoculars from our car at a distance of fifty feet and then approached on foot to within twenty feet when it flew a short distance down the beach. This island harbors scores of breeding birds of this species in summer but so far as I am aware this is the first winter record for the state.

Icterus galbula. Baltimore Oriole.—On February 13, 1934, I received an adult male of this species in fine plumage but very thin, taken the previous day at Pineville, Berkeley Co., S. C., about fifty miles north of Charleston. It had been observed by a friend of the writer for some days and not knowing what it was he collected it. It constitutes the first South Carolina winter record. In January and early February, 1933, I heard persistent rumors of the presence of one of these birds at Summerville, S. C., but it was not secured.—Alexander Sprunt, *R. F. D. No. 1, Charleston, S. C.*

Notes from Chatham County, Georgia.—*Fregata magnificens*. Man-o'-war-Bird.—A fine specimen was shot on Wassaw Island on May 16, 1933, and finally fell into the hands of Mr. Gilbert R. Rossignol, at the Savannah Quarantine Station, Savannah. He was able to save the head only. There is at least one other definite Georgia record (Auk, XXIX, p. 531).

Lobipes lobatus. Northern Phalarope.—I collected a female in breeding plumage in the river near Savannah, on May 24, 1933, and was told of another Phalarope, probably of this species, seen farther up the river, on about this date. This is, I believe, the first specimen to be taken in the state.

Larus hyperboreus. Glaucus Gull.—A single individual was seen below the city, on December 9, 1933 by Mr. Ernest Wells and myself. We had an excellent chance to compare it with the Herring Gulls, both in color and size. The two specimens taken here and recorded (Auk, XLVIII, p. 435) are the only other records for the state.

Sterna antillarum antillarum. Least Tern.—A bird banded by Rossignol on Oysterbed Island, June 17, 1923, was shot a few miles south of Savannah, July 9, 1933. This bird was therefore ten years old. Such accurate records of longevity under natural conditions are not too plentiful.

Thalasseus maximus maximus. Royal Tern.—Rossignol found a few birds nesting on Oysterbed Island June 17, 1933. This may be a first breeding record for the state. With many years of study and collecting along this coast he has no knowledge of its breeding within the state before,

though there is a colony in St. Helen Sound, S. C., about sixty miles to the northward.

Tyrannus dominicensis dominicensis. GRAY KINGBIRD.—Rossignol, who is thoroughly familiar with this species in its normal range, saw and heard a single bird near Quarantine Station June 8, 1933. Quarantine is near the river mouth, fourteen miles east of the city. There are no other Georgia records.

Muscivora forficata. SCISSOR-TAILED FLYCATCHER.—Rossignol collected a fine full plumaged male at Quarantine on June 5, 1933. This is apparently a first record for the state.—IVAN R. TOMKINS, *U. S. Dredge Morgan, Savannah, Ga.*

Notes from the Coastal Counties of Alabama.—*Casmerodius albus egretta.* AMERICAN EGRET.—On July 4, 1933, on a visit to a rookery in the northern part of Mobile County, eleven miles south of Mt. Vernon, a number of Egrets were found nesting in company with Anhingas, Little Blue Herons, and Yellow-crowned Night Herons. About 100 young Egrets were counted, most of them able to fly but some still in the nests. This is the only definite breeding record for this species in Alabama, although, as Mr. A. H. Howell says (Birds of Alabama, 1924), it undoubtedly bred in former times before its near extermination by the millinery trade.

Larus philadelphia. BONAPARTE'S GULL.—Two of these Gulls, now in my collection, were taken by John Middlebrooks at Gasque in the southern part of Baldwin County, on January 14, 1933. Howell cites only a single record for the state—January 25, 1912. It is not unlikely, however, that this species has been merely overlooked on the coast of Alabama since it is known to occur commonly on the nearby coast of Florida.—DUNCAN MCINTOSH, *Fairhope, Alabama.*

Notes from Buchanan County, Iowa.—*Cyanocitta cristata cristata.* NORTHERN BLUE JAY.—Each year this bird performs a more or less regular migration in Iowa. While many remain as residents through the winter, small flocks are occasionally seen proceeding south during September and October. During the fall of 1933, I saw one flock of fifteen and another of fifty going south on September 21; another flock of 75 was seen on September 29. Doubtless there were other flocks that I did not see.

Corvus brachyrhynchos brachyrhynchos. EASTERN CROW.—Seldom seen here in migration. On the afternoon of October 16, 1933, I saw a loose, scattered flock of about 75 Crows flying south. They appeared to be migrating, flying steadily and with apparent determination, and were soon lost to sight beyond the southern horizon. Another flock of 30, migrating in the same manner, was seen on October 19, 1933.

Colaptes cafer collaris. RED-SHAFTED FLICKER.—On October 29, 1933, one was seen in the woods about a mile south of the village of Otterville. My wife, my son Paul A. Pierce and I were walking through a field beside the woods, when the bird flew up from the ground a short distance in

front of us. We at once noticed the flash of the deep red wings as it flew. It alighted on a tree trunk about four rods away, and we studied it at some length with an 8 x glass in sunlight. The under side of the tail showed orange-red which Dr. Roberts in his 'Birds of Minnesota' says may be an indication of a hybrid bird. We were unable to make out the color of the cheek-patch. On a later trip I did not find the bird.

Buteo borealis. RED-TAILED HAWK.—In late October, 1933, while stacking corn-fodder, we had occasion to note the efficacy of this hawk as a mouser. The shocks of corn furnished homes for many field mice, which ran out in all directions as we loaded the shocks onto the wagon. The Hawks were in migration at this time. Shortly after we began work we noticed several immature Red-tails following our wagon and swooping upon the mice only three rods from us. These birds were much less wary than the adults, of which there were a few that perched in nearby trees or sailed about in the air at a safe distance. When we drove away from the field they joined the young birds in catching the mice. These four or five Hawks must have captured a great many mice from this field during the time we were at work there. Before our eyes we had an example of the valuable work this Hawk performs as a mouser, yet the young farmer who was helping me kept remarking about the "nice shot" and what he would like to do if he had a gun—showing a common prejudice inborn of many generations of farmers.

Hesperiphona vespertina vespertina. EASTERN EVENING GROSBEAKS.—On December 11, 1933, Mrs. John M. Pierce saw a flock of ten at her home in Winthrop. The birds remained about the place for several hours on that morning, while Mrs. Pierce studied them with her glass. The bright plumage, markings over eyes and on wings, and large, heavy bills, were carefully noted.—FRED J. PIERCE, *Winthrop, Iowa.*

Notes from Wisconsin.—*Casmerodius albus egretta.* AMERICAN EGRET.—This species appeared in several places in the late summer of 1933. In the period August 23 to September 14, one or two birds were seen by me in the pond formed by the dam on the Sugar River at Monticello, Green County. The keeper of the filling station at the bridge stated that at one time "over a dozen" of them were present.

I have been informed by Mr. R. J. Meyer, Secretary of the Outagamie County Park Commission that a flock appeared at the shallows of the Fox River below Kaukauna the end of July and remained until the opening day of the hunting season, September 21. The greatest number seen by him was twelve, though as many as twenty-one were reported.

Reports were received also of occurrences at Rock and Koshkonong Lakes in Jefferson County.

Mimus p. polyglottos. MOCKINGBIRD.—The morning of June 11, 1933, a Mockingbird was found singing near Cross Plains, Dane County. The greater part of the day was spent searching for a nest, but without success. This was probably a drifting, unmated bird as it could not be found subsequently.

Toxostoma rufum. BROWN THRASHER.—On December 24, 1933, a Brown Thrasher was found at the Pharmaceutical Gardens near Madison. It was feeding on wild grapes and appeared to be in excellent condition.—A. W. SCHORGER, *168 North Prospect Avenue, Madison, Wisconsin.*

Notes from Eastern Kansas.—*Anas rubripes rubripes.* RED-LEGGED BLACK DUCK.—An adult male, killed by a Duck hunter on the Kansas river near Lawrence, has been referred to this subspecies. It seems to be intermediate between *rubripes* and *tristis*, but is closer to the former. This large Duck is very rarely seen here, there being only five Kansas specimens in the Kansas University collection. G. C. Rinker has one in his collection of Greenwood County birds.

Charitonetta albeola. BUFFLEHEAD.—A single adult male of this little Duck was taken by Mr. H. K. Saunders, on the Kansas river, six miles east of Lawrence, on November 10, 1933.

Coturnicops noveboracensis. YELLOW RAIL.—Mr. G. A. Whitney, of Clearwater, Sedgwick County, sent in one of these birds alive on October 21, 1933. It was in captivity one week. Three specimens have been taken in Douglas, and one in Greenwood Counties.

Philohela minor. AMERICAN WOODCOCK.—There is a mounted Woodcock in the University collection, taken at Lawrence on November 21, 1885. Since then, not one had been taken here, until October 21, 1933, when Ed Martin found an adult female lying dead on the street car tracks on the University campus. The skin was damaged about the head, and the bill was broken, as if the bird had been killed by striking the trolley wire. Mr. C. D. Bunker, who has been at Lawrence for almost forty years, has never seen it here. There is one specimen in the Rinker collection.

Dolichonyx oryzivorus. BOBOLINK.—On September 20, 1933, the writer took a single individual from a small flock in the bottom lands south of Haskell Institute, at Lawrence. Four days later he and Mr. N. A. Preble took three more specimens from what was apparently the same flock. This is the first recorded occurrence of the bird in Kansas in the fall. The birds were feeding on the dried heads of wild sunflowers.

Acanthis linaria linaria. COMMON REDPOLL.—Three Redpolls were taken by Mr. J. D. Black, and Mr. N. A. Preble in the Haskell bottoms on November 18, 1933. The species has been taken only twice before in Douglas County, but has been recorded from Hamilton, Neosho Falls and Manhattan.

The writer is indebted to Mr. C. D. Bunker, Assistant Curator in Charge of the Museum of Birds and Mammals, for permission to record these notes. —W. S. LONG, *Museum of Birds and Mammals, Lawrence, Kansas.*

The Shifting of the Route of Migrating Birds Due to Wind.—A change of migrating routes for birds was observed along the North Platte River near Torrington and Lingle in Goshen County, Wyoming, during May, 1933.

The prevailing wind in eastern Wyoming is southwest, but during the first half of May 1933 it blew almost continuously from the east, southeast or northeast. This acted on the migrating birds in a manner opposite to the ordinary and produced a constant push toward the west with the result that birds that normally migrate north through Kansas, Nebraska, and the Dakotas were pushed toward or into Colorado, Wyoming, and Montana.

Franklin's Gulls (*Larus pipixcan*) which were not seen at all in 1931 and 1932, were common near Torrington from May 5 to May 12, 1933. Warblers which are usually rather rare were tolerably common. The Black and White Warbler (*Mniotilta varia*) which is usually so rare that I consider myself lucky to see one a year, was present every day from May 10 to May 13, and on the last day I counted five individuals. Black-poll Warblers (*Dendroica striata*) were present from May 10 to 14 and on one day I counted eight individuals while in 1932 I saw only two. The best record was that of the Western Palm Warbler (*D. p. palmarum*) May 10, 1933, the only one yet recorded from Wyoming. Other Warblers observed that are rather rare in this locality were: the Northern Parula Warbler (*Compsothlypis a. pusilla*) May 12; Nashville Warbler (*Vermivora ruficapilla*) May 9; Grinnell's Water-Thrush (*Seiurus n. notabilis*) May 10 to May 14; Tennessee Warbler (*V. peregrina*), May 23; Magnolia Warbler (*D. magnolia*), May 23 and May 24; Oven-bird (*Seiurus aurocapillus*), May 25. The last six birds named have all been previously observed in Wyoming but not all in the same year. Spring records were obtained for the Pectoral Sandpiper (*Pisobia melanotos*), May 12; Harris's Sparrow (*Zonotrichia querula*), May 12 to 14; and White-throated Sparrow (*Z. albicollis*), May 13, birds that were not observed in May of 1931 and 1932.

In May of 1932 a flock of Bendire's Crossbills (*Loxia c. bendirei*) and some Black-headed Jays (*Cyanocitta s. annectens*) were seen near Torrington quite a distance from their usual habitat. The westerly winds prevailing in 1932 would make it easy for them to get so far from the mountains but it would not be so easy against the easterly winds of 1933, hence none would be expected and none were seen in 1933.

Another unusual find was a Gnatcatcher, subspecies unknown, seen near Torrington, May 24, 1933, the most northern record for the bird in Wyoming. Its presence here is considered to be accidental, probably the result of a severe south wind on May 22.

An unusual number of Warblers was noticed also in Colorado in 1933. W. H. Bergtold of Denver states that "The Warbler tribe came to Colorado this spring in extraordinary numbers and kinds" (Bird-Lore, Vol. XXXV, p. 217, 1933).—Otto McCreary, *Laramie, Wyoming.*

RECENT LITERATURE.

Lanier's 'A. B. Frost the American Sportsman's Artist.'—No sportsman's "den" in recent years has been considered quite complete without one or more of Frost's shooting pictures, and probably no illustrator of the popular magazines of the nineties became so close to the readers as did A. B. Frost. It will therefore be a satisfaction to his host of friends, both those who knew him personally and those who knew him only through his work, that a tribute to the man and artist, such as Mr. Lanier has produced, should be made available to all.

Mr. Lanier points out the attitude of art critics of considering sporting art as the "poor relation to Art" proper, and of referring to it as "art for sport's sake," and then goes on to show the important place that has been accorded it in other countries and the lack of appreciation in America. His handsomely gotten up book[1] with its numerous delightful reproductions of the artist's work is not only a biography of Frost but contains a most interesting résumé of shooting and fishing and general outdoor life in Philadelphia, the "city of sporting pleasures," from 1850 to 1890. Frost's drawings, he says, "cover thirty or forty years of what is, for the sportsman, a vanished America. They represent dozens of scenes close to cities and seaside resorts which have since stretched out and engulfed the former haunts of quail and grouse and shore-birds. The motor car speeded up the change, bringing a horde of gunners, who had no characteristic of the sportsman except the desire to shoot something, into choice spots once safely remote from the crowd. We have now reached the age of great private preserves, licenses to shoot and fish, commercial game farms, operating under state game breeder's licenses and open to hunters on payment of specified fees, ordinary farmers who must be paid for the right to hunt over their property—and with it all, far less chance to get a day's sport than when we travelled seven miles an hour behind a horse instead of forty in an automobile. That is progress. It must be accepted as a fact like any other "Car of Juggernaut." As true a picture as we have seen anywhere! And it is no wonder that the old time sportsman feels like abandoning his pursuit entirely! The main text of the book is replete with extracts from Frost's letters to his friends describing trips to the south and west, while the author's sympathetic account of his life and work gives us an intimate picture of the man.

The illustrations, some sixty-five in number, represent the best of the artist's sporting pictures beautifully reproduced, and including the twelve that made up his famous series of "Shooting Pictures." There is also a reproduction of the entire text of a humerous account of "The Great

[1] A. B. Frost | the | American Sportsman's | Artist | By Henry Wyshan Lanier | Illustrated | New York | The Derrydale Press. 1933. Pp. i–xvi + 1–164 + many plates on unnumbered pages. Size 9 x 12 ins. Price $17.50. The Derrydale Press, 127 East 34th St., New York City.

Pigeon Shoot on Christmas Day 1875" written in long hand by Frost and interspersed with amusing pen sketches, as well as two full page portraits of Frost by his wife and by Thomas Eakins.

Mr. Lanier has produced a beautiful and most readable book which should find a place in every sportsman's library, as well as in that of every lover of nature and outdoor life.—W. S.

Madon's 'Les Rapaces d'Europe.'[1]—This report brings into one volume the bulk of existing knowledge of the food habits of both the nocturnal and the diurnal raptors of Europe, and is a compilation of published and unpublished data from the works of economic ornithologists throughout continental Europe and the British Isles. The summarized data from analyses of the contents of no fewer than 10,000 stomachs and 65,600 pellets have entered into its text and tables. To say the least, the bringing together of these scattered data from a host of different sources, recorded in many languages, has been a task of considerable proportions.

From these summarized data the author concludes that only the Long-eared Owl (*Asio otus*) and the Short-eared Owl (*Asio flammeus*) of the nocturnal raptors merit complete protection. The European Barn Owl (*Tyto alba*), Tengmalm's Owl (*Aegolius funereus*) and the Eagle Owl (*Bubo bubo*) are classed as destructive, while for the Snowy Owl (*Nyctea nyctea*), the European Hawk Owl (*Surnia ulula*), and the Lap Owl (*Scotiaptex lapponica*) toleration is recommended, especially in the more sparsely populated regions where they exert considerable pressure on the migratory lemming. The Tawny Owl (*Strix aluco*) is considered more or less indifferent economically, while the Little Owl (*Athene noctua*) and the European Scops Owl (*Otus scops*) are thought to be of value occasionally. Of the diurnal birds of prey, the Vultures and the large Eagles are placed in a class by themselves as deserving protection because of their rarity. The Honey Buzzard (*Pernis apivorus*), the Short-toed Eagle (*Circaëtus gallicus*), and the Western Red-legged Kestrel (*Falco vespertinus*) are considered useful, and the Hen-Harrier (*Circus cyaneus*) indifferent. The Sparrow Hawk (*Accipiter nisus*), the Hobby (*Falco subbuteo*), and the Merlin (*Falco columbarius aesalon*), along with the Buzzard (*Buteo buteo*), are left more or less on the border line. Bonelli's Eagle (*Hieraaëtus fasciatus*), the Booted Eagle (*Hieraaëtus pennatus*), the Marsh Harrier (*Circus aeruginosus*), both Kites (*Milvus milvus* and *Milvus migrans*), the White-tailed Eagle (*Haliaeëtus albicilla*), the Goshawk (*Accipiter gentilis*), the Peregrine Falcon (*Falco peregrinus*), and the Osprey (*Pandion haliaetus*) are "outlawed" as being too destructive to be tolerated. These conclusions, of course, are strictly those of the author, and do not necessarily represent the opinions of other European investigators whose data he uses.

[1] Les Rapaces d'Europe, leur régime, leurs relations avec l'Agriculture et la Chasse. P. Madon. Chez l'Auteur, 5, Avenue Vauban, Toulon, France. 292 pages. 1933. Price 35 francs.

The most revolutionary of these conclusions is that which concerns the Barn Owl, a raptor generally recognized as useful. In summarizing the economic status of this Owl the author writes as follows: "I maintain, therefore, although alone against all, that the Barn Owl is destructive everywhere in Europe, extremely destructive in France, because of favoring to the highest degree the multiplication of rodents and of insects harmful to our crops." Anaylsis has revealed that in Europe the food of this raptor consists of approximately 65 per cent rodents (chiefly Arvicolidae), 31 per cent shrews (principally *Crocidura* sp. and *Sorex vulgaris*), and the remainder of miscellaneous items including bats, reptiles, batrachians, and fish. It is on the basis of the shrew content that he contends the Barn Owl is one of the most destructive Owls in Europe, for to the shrews he attaches great importance in the control of small rodents and injurious insects. The actual ratio between shrews and meadow mice in the diet does not, in his opinion, convey the whole story. On the basis of comparative fecundity and precocity of shrews and meadow mice he writes, "The destruction of ten shrews has more significance than that of one hundred meadow mice, species of which the powers of reproduction permit immediate replacement when food abounds, and which can only be controlled by unlimited forces of action, such as diseases and inclemencies." In view of the latter statement, it is difficult to see justification for attaching so much importance to shrews in the control of meadow mice, and it is equally difficult likewise to justify the importance attached to shrews in the control of destructive insects. Shrews have generally been recognized as useful, but we know of no previous instance in which their usefulness has been so generously evaluated. (To appreciate Madon's discussions fully, one should read in this connection Guerin's 'L'Effraye commune en Vendee,' Encyclopedie Ornithologique, Vol. IV, inasmuch as both authors worked together over much of the Barn Owl material, and interestingly enough arrived at opposite conclusions on practically all major issues.)

We find in Madon's report a most positive and unqualified contention that preference plays an important part in determining the prey that enters the diet of raptors. We read, for instance, that the Barn Owl exhibits a preference for shrews, that the Osprey has a preference for fish, the Peregrine Falcon for Pigeons, et cetera. The Osprey, he says, represents a case of extreme specialization among raptors, and is an example of a bird showing preference to the highest degree in the taking of its prey. Specialization is one thing and preference something very different; Madon seems to confuse the two. The former may be the result of any of a number of factors or combination of factors, of which anatomical modification, size, strength, speed, versatility of flight, and temperament are only a few, that may serve in one way or another to determine the the availability of prey. Preference implies a deliberate seeking out of certain types of prey when others are equally or more available. With the Osprey, the taking of fish to the exclusion of other prey illustrates

extreme specialization, but not necessarily preference in the correct usage of that term, since, practically speaking, fish may constitute the only type of prey available. The ecological information concerning the relationship between the raptor and its prey is too meagre for one to assert, positively and without reservations, that any raptor will take by preference any prey out of proportion to other easily obtainable and available ones.

Of particular interest to ornithologists in this country are the comparisons that Madon makes between certain American species and closely related or identical European ones. He has utilized the data from the analyses of 2,100 stomachs and 3,610 pellets of American raptors, drawing these data principally from Fisher's 'Hawks and Owls of the United States,' Henderson's 'Practical Value of Birds,' and Stoddard's 'Bob-white Quail.' It is unfortunate that suspicion has been cast upon one of our Owls generally recognized as useful. Concerning our Long-eared Owl (*Asio wilsonianus*), a close relative of the European Long-eared Owl (*Asio otus*), he writes, "Some 260 pellets from 2 localities have given 303 vertebrates, of which there were 30 Muridae, 224 Arvicolidae, 28 shrews, 8 moles, and 13 passerine birds. These latter three categories are represented in the diet to a greater extent than in Europe, and the usefulness of this owl ought to be contestable if the *Blarina* have habits of our shrews." These particular data were taken from Henderson's 'Practical Value of Birds.' In lumping the various species of small rodents he has obviously encountered some difficulty in the interpretation of common names, for he has placed the white-footed mice and Cooper's mice along with the house mice and a Norway rat with the Muridae, and likewise has erred in considering the lemming voles as moles. This entanglement is partly due to inconsistency in the use of common names by Henderson, who in the same paragraph uses the names field mice and meadow mice to denote *Microtus*, and the names Cooper's mouse and lemming vole to denote *Synaptomys cooperi*. At any rate, there were no moles represented in these analyses. As for the 28 shrews and 13 passerine birds, numerically they make up only slightly more than 13 per cent of the total number of vertebrates. On this basis, the useful role of the bird is hardly contestable.

The author has not been unmindful of the educational responsibilities that are attached to a work of this type. He has condemned bounties as being the cause of much of the indiscriminate persecution of raptors. He has voiced a protest against the commercialization of egg-collecting, which he claims has reached in Europe the status of postage-stamp-collecting. He has encouraged ornithologists, taxidermists, and hunters to forward stomachs of all birds of prey that may come into their hands to specialists, or, if this is not feasible, to make as detailed an examination of the contents as possible themselves, even if for only the vertebrate content. To assist such studies he has devoted several pages to describing skeletal characteristics of the major groups of vertebrate prey. It is to be regretted that the financial means were not available to include illustrations, which

greatly enhance the value of educational literature. Further, it is unfortunate that Madon's work is so replete with argumentative discussion and criticism of the investigations of other scientists, much of which is not particularly appealing to readers only mildly interested in the economics of wild life, and which serves to obscure the more significant matters that should receive emphasis.

In spite of its shortcomings, the report, with the exception of the index, has been mechanically worked up in good fashion; and owing to the abundance of tables summarizing available information it is valuable as a reference work on the food habits of European raptors.—A. L. Nelson.

Lambrecht's 'Handbuch der Palaeornithologie'.[1]—The product of many years of painstaking research and compilation this work has no equal in the literature of ornithology in scope and detail so far as the subject of fossils among birds is concerned.

The author begins with a brief statement of museums where fossil birds are found as well as collections of skeletons of modern birds for comparison. This is followed by an account of the bird skeleton where figures of the different bones have names indicated for parts and processes. The next section, in detailed statement covering nearly 600 pages, deals with all known fossil records from a systematic standpoint, including not only those forms that have been definitely named but also records identified to genus, family or order. The account is thus exceptionally complete. Under each species there is given the place of original description, other references in literature, including synonymy, a list of specimens with the museum in which they are found when this is known, the age and type locality, and remarks on status and other interesting matters. The details naturally are more complete for Old World species where the author has examined the material; in other cases there are usually quotations from the original describer.

In many instances under the Order there is included a general history of the group as shown by the known fossils with indication of the probable affinities of the different forms, fossil and living. Supposed lines of descent are frequently shown in tabular form with the geographic distribution of the fossils. As one interesting aside there is given a résumé of stories of the fabulous Roc of Marco Polo and other travelers. The entire work is profusely illustrated with reproductions of original figures and restorations. While the preface is dated July, 1931, an addendum brings the information included down to December 15, 1932.

To indicate briefly a few of the important proposals in this work, *Gastornis*, *Remiornis*, *Dasornis*, and *Macrornis* are included in the order Diatrymiformes with *Diatryma* and *Omorhamphus*. The family Elopterygidae (p. 287) is erected for *Elopteryx nopcsai*, *Eostega lebedinskyi* and *Actiornis anglicus*.

[1] Handbuch | der | Palaeornithologie | von | Kalmán Lambrecht | A. O. Universitätsprofessor | Mit 209 Textabbildungen und 4 Tafeln | Verlag von Gebrüder Borntraeger in Berlin W 35 | 1933. Pp. i-xx + 1-1024, 209 figs., price 115 RM.

To continue, Dr. Lambrecht has given considerable attention to the question of generic relationships to the end that he has proposed numerous new generic terms as indicated in the following list (some of these have appeared in earlier papers): *Oligocorax* (p. 290), including *Phalacrocorax marinavis* Shufeldt and *P. mediterraneus* Shufeldt; *Miocorax* (p. 291) including *Phalacrocorax femoralis* L. H. Miller; *Paracorax* (p. 292); *Australocorax* (p. 293); *Parascaniornis* (p. 335); *Aquilavus* (p. 407); *Archaeophasianus*, for *Phasianus roberti* Stone and *P. miocaenus* Shufeldt; *Miophasianus* (p. 439); *Miogallus* (p. 442); *Quercyrallus* (p. 461); *Palaeoaramides* (p. 462); *Paraortygometra* (p. 462); *Rallicrex* (p. 463); *Pararallus* (p. 466); *Miorallus* (p. 466); *Fulica-aletornis* (p. 479) for *Aletornis venustus* Marsh; *Miofulica* (p. 480); *Moreno-merceratia* (p. 512); *Probalearica* (p. 519); *Pliogrus* (p. 522); *Gerandia* (p. 602); *Archaeopsittacus* (p. 609); *Paratrogon* (p. 629); and *Palaeopicus* (p. 629); and *Miocorvus* (pp. 636 and 1024).

The following new species are described: *Ciconia gaudryi* (p. 323) from the lower Pliocene of Pikermi; *Parascaniornis stensioi* (p. 335) from the Cretaceous of Ivö, Sweden; *Anas isarensis* (p. 361) from the Upper Miocene near Münich; *Anas eppelsheimensis* (p. 362) from the lower Pliocene of Eppelsheim, Germany; *Cygnus csákvárensis* (p. 383) from the Upper Miocene of Hungary; *Francolinus capeki* (p. 433) from the Upper Pliocene of Hungary; *Rallicrex kolozsvárensis* (p. 463), from Upper Oligocene or lower Miocene beds near Kolozsvár, Hungary; and *Pliogrus germanicus* (p. 522) from the lower Pliocene of Eppelsheim, Germany. *Palaeortyx gaillardi* (p. 451) is given as a new name for *Palaeortyx cayluxensis* Milne-Edwards 1893, preoccupied by *P. cayluxensis* Lydekker 1891.

All together there are listed 691 fossil forms of which 276 come from Europe and 179 from North America.

The systematic list is followed by a discussion of the forms found in the various strata with the data divided under the different continents. In this there are included references to modern birds whose remains occur in the Pleistocene. The section closes with a few paragraphs devoted to figures of birds carved by prehistoric men.

The final portion of the book is devoted to general discussion that treats of fossilization, chemical composition of fossil bones, mummified birds, fossil feathers, tracks, eggs, nests gastroliths and coprolites. The work closes with a discussion of the development of various factors in the life of the bird and of evolution in the group. Throughout the volume there are many bibliographic references to important literature, such a section beginning the account of each order. As indicative of the extent that this may reach, ten pages are required to list the papers on the Moa.

Though critical examination may reveal occasional errors these become insignificant when the entire volume is considered and the work as a whole can have only the highest commendation. It will stand as the most

important contribution in its field for many years to come and should be invaluable as a work of reference in every comprehensive library devoted to ornithology.

The labor involved in the preparation of this volume can be realized only by first hand examination since in this way alone can one appreciate the detail in which many sections are covered and wealth of information that is included. The subject of fossil birds long has been one of considerable difficulty due in large part to the scattered literature of the subject. With Lambrecht's comprehensive work these difficulties largely disappear so that for the first time this section of our science is placed on a definite footing that allows a comprehensive insight into the subject on a world wide basis. Future investigations will build on this volume as on a foundation for further advance in the field concerned.—A. W.

Priest's 'Birds of Southern Rhodesia.'—We had occasion to review Capt. Priest's earlier 'Guide to the Birds of Southern Rhodesia' in 'The Auk' for 1930. Our author has now presented the first volume of a much more pretentious work[1] on the same subject, his object being "to redeem the errors of my previous book, and to give the public a more accurate knowledge" of the subject.

Nomenclature, the physical features of the country, faunal distribution, etc., are treated in the introduction to which are added a glossary and details as to measurements, and an explanation of the keys for identification.

The text under each species is divided into "distribution," "habits and general notes," and "description," and in addition to his own notes and observations the author has quoted freely from a number of standard works on African birds and from certain general works, thus providing the reader with a large amount of valuable and instructive information. Keys to the genera and species furnish an easy way to identify any specimen that may come to hand, while striking field characters are mentioned.

There is a good colored map of the country, ten colored plates of birds, and 120 text figures, apparently from pencil drawings. While these are sufficiently large and detailed to give one an idea of posture and style of coloration, and are thus a distinct aid to identification, they are decidedly crude as compared with most ornithological illustrations of today.

Capt. Priest has we think produced a book that cannot but arouse interest in the birds of Rhodesia and is calculated to develop a number of ornithologists in the coming generation, while it will furnish a reliable list of the avifauna of a country about which we have all too little ornithological literature.

The author's accounts of his personal experiences with various species make interesting reading. We learn about the little *Nettapus*, the so-

[1] The Birds | of | Southern Rhodesia | By | Captain Cecil D. Priest | [etc. etc.] | Map and Ten Coloured Plates | One hundred and Twenty Illustrations | Volume One | Printed by | William Clowes and Sons, Limited | London and Beccles | Obtainable from them at 94, Jermyn Street, London, S. W. 1, or from | The "Herald" Book Store, Salisbury, Southern Rhodesia. | 1933. Pp. i-xxxii + 1–454.

called Pygmy Goose, that it is found on fair sized expanses of water which are well overgrown with water lillies and when alarmed it dives at once reappearing at a considerable distance, its varied plumage harmonizing with the leaves and flowers so that it is not easy to see after having done its "vanishing trick."

Of Shelley's Francolin we learn that its call is heard about the houses almost every day in the year, a loud whistle that sounds like "I'll drink yer beer," repeated at least three times. So here, as in almost every country, we find birds with calls that at once seem like words or phrases and which are not infrequently adopted as the vernacular names of the species.

This volume covers the Ostriches, Penguins, Grebes, Petrels, Herons, Ducks, Hawks and Game Birds, and we shall look with interest for its successor, which is expected to appear early in March, 1934.—W. S.

La Touche's 'Handbook of the Birds of Eastern China.'—The latest part of this standard work,[1] rapidly approaching completion, is entirely devoted to the water birds from the Shore-birds to the Ducks. It fully maintains the high standard of the preceding parts and carries two halftone illustrations. We note that no less than 720 species have been described and discussed in the work up to and including this number.—W. S.

Lynes on the Birds of the Ubena-Uhehe Highlands and the Iringa Uplands.—In this paper[2] are presented the results of an expedition to southern Tanganyika Territory undertaken in 1930–31 by Admiral Lynes and Mr. Willoughby Lowe. There is a very fully annotated list of 324 species, collected or observed, in which will be found a wealth of data on molt, distribution, nesting, habits etc., with marginal symbols to indicate the relation of the distribution of each species to the discussion on faunal relationships which forms the preceding portion of the report.

Admiral Lynes' conclusions on this problem, after an intimate study of the country and of his collections, is that the avifaunae of what he terms the highlands, lying above the 1900 meter contour line, and the upland lying below this level, are so strikingly different that their differences cannot be explained by altitude nor by environment, and that they are in fact as different as are those of parts of Africa which are considered as constituting different avifaunal subdivisions. In other words it is suggested that differences in the two regions under discussion are due mainly to some much less obvious cause, doubtless originating from conditions in the remote past.

There are many illustrations of the country from photographs and an account of the itinerary of the party and of the climate and physical features of the regions traversed.

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[1] A Handbook of the Birds of Eastern China. By J. D. D. La Touche, Vol. II, Part V. Pp. 401–496, January, 1934. Price 7s. 6d. net, per part. Taylor and Francis, Red Lion Cort, Fleet Street, London, E. C. 4.

[2] Birds of the Ubena-Uhehe Highlands and Iringa Uplands. Contribution to the Ornithology of southern Tanganyika Territory. Jour. f. Ornith. Vol. 82, 1934, Sonderheft. Pp. 1–147, pll. 15. February 20, 1934.

Admiral Lynes has made another valuable contribution to the zoogeography of Africa as well as to the ornithology of the area covered, which should be considered in connection with the publications of Loveredge, Chapin and Bowen on the distribution of African birds.—W. S.

Holman's 'Sheep and Bear Trails.'—Mr. John P. Holman has recently published an attractive series of hunting experiences in Alaska and British Columbia, under the above title,[1] dealing mainly with white sheep, Rocky Mountain goats, and bears, with a little prelude dealing with the lure of the 'Rivers of the North.' There are a number of good halftone illustrations from photographs of the country and the game.

While ornithologists with a liking for the wilderness trail will find much good reading in Mr. Holman's accounts of his trips it is his final chapter that will appeal especially to the bird lover: 'The Keeper of the Swans.' This consists of verbal accounts and letters of Ralph A. Edwards, of British Columbia, who located on one of the lonely lakes of this country where a few Trumpeter Swans come every year. He has taken upon himself the protection of these fast disappearing birds and does all in his power to guard them against any possible enemies. Severe winters prove very hard on the birds and some of them perish though others were saved from starvation by feeding them on cabbage until their strength was regained. The history and personality of the "keeper" are as interesting as his account of the birds.—W. S.

New Boat-tailed Grackles.—While the recent discussion in 'The Auk' on the color of the iris of the Boat-tailed Grackle brought out the apparent fact that there were two forms of the bird, no one seemed anxious to pursue the matter further until quite recently, when two papers on the subject appeared almost simultaneously. One by Mr. Alexander Sprunt, Jr.,[2] names the brown-eyed bird as new under the name *Cassidix mexicanus westoni*, type from St. John's River Marshes, Indian River County, Florida; the other by Dr. Francis Harper[3] describes the yellow-eyed bird as new with the name *Cassidix major torreyi*, type from Chincoteague, Virginia.

The first Boat-tail to be described was named by Vieillot *major* and was from Louisiana; it was therefore necessary at the outset to find out what the color of the eye was in Louisiana birds, since Vieillot failed to mention this point, in order to fix his name on one form or the other. Mr. Sprunt says "the fact that the birds of the type locality are yellow-eyed proves it to be a characteristic of that form (*major*)," but gives no further evidence

[1] Sheep and Bear | Trails | A Hunter's Wandering in | Alaska and British Columbia | by | John P. Holman | introduction by | Capt. Robert A. Bartlett | Approved by the | Boone and Crockett Club | With 43 Illustrations | New York | Frank Walters | Grand Central Palace | 1933. Pp. i–xvi + 1–211. Price $3.00.

[2] A New Grackle from Florida. By Alexander Sprunt, Jr. Charleston Museum Leaflet, No. 6. February 24, 1934. Pp. 1–5.

[3] The Boat-tailed Grackle of the Atlantic Coast. By Francis Harper. Proc. Acad. Nat. Sci. Phila., LXXXVI, 1934, pp. 1–2. March 8, 1934.

as to the source of his information. Dr. Harper states that "Mr. Alfred M. Bailey has recently secured the desired information [on the color of the iris] in Louisiana and has generously passed it on to me." As he describes the yellow-eyed bird as new it is inferred that Mr. Bailey's birds had brown eyes!

We now face a curiously involved problem with conflicting statements as to the eye-color of the Louisiana birds which is the crux of the whole matter! At any rate both forms have now been abundantly named and Louisiana ornithologists have an important task before them to determine positively whether their Boat-tails have yellow or brown eyes or whether both sorts occur there.—W. S.

Griscom's 'Birds of Dutchess County, New York.'—This handsomely gotten-up publication[1] is a memorial to the late Maunsell S. Crosby by his most intimate ornithological friend and associate, and dedicated to him by the Linnaean Society of New York, of which he was an active member and in whose 'Transactions' it appears.

Mr. Crosby had intended to prepare this report himself and in carrying out his intention the author, who accompanied him in much of his field work, has made full use of Crosby's notes as well as those of other members of the Society who have carried on field studies in Dutchess County.

Besides the fully annotated list of 254 species there is a discussion of migration in the county with a reproduction of several of Crosby's carefully prepared daily lists and a grouping of the breeding species into Carolinian and Canadian categories, the former more strongly represented in the Hudson Valley than in the Connecticut Valley at the same latitude.

Mr. Griscom in his careful preparation of this report, has evidently considered it a labor of love and a tribute to a dear friend, and it will be a satisfaction to Mr. Crosby's many associates to see this work which he had always had in mind, completed in such an admirable manner.—W. S.

Willett's 'List of the Birds of Southwestern California.'—The members of the Cooper Ornithological Club show a commendable interest in keeping their distributional lists up to date. In 1912 Mr. George Willett published as 'Avifauna No. 7' a brochure of 120 pages on the distribution of the birds of the coast region of southern California. Now after twenty years he has just published a revised edition[2] of 200 pages, entirely re-written and embodying the results of a very active period in the ornithology of the region.

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[1] The Birds of Dutchess County | New York | From Records Compiled By | Maunsell S. Crosby | By Ludlow Griscom | With Three Plates | Published by the Society, December, 1933 | New York; | Press of Urner-Barry Company | MCMXXXIII Trans. Linn. Soc. of New York, Vol. III. Pp. 1–184.

[2] A Revised List of the Birds of Southwestern California. By George Willett. Contribution from the Los Angeles Museum. Cooper Ornithological Club Pacific Coast Avifauna Number 21. Los Angeles. Published by the Club. December 1, 1933. Pp. 1–204. Price $4.00.

The nomenclature, except in a very few instances, follows that of the A. O. U. 'Check-List,' and the text abounds in accurate records of captures and observations by a host of bird students. The general form and method of treatment follow those of the other similar publications of the Club and from a hasty examination Mr. Willett seems to have done an excellent and accurate piece of work. We cannot but wonder, however, whether he has not inadvertently used the word "nomenclature" for "classification" on p. 5 of the introduction, where he says: "The nomenclature of the A. O. U. Check-List is based largely on the work of Max Fürbringer, Hans Gadow and Robert Ridgway, revised by Alexander Wetmore."—W. S.

Saunders and Dale on the Birds of Middlesex County, Ontario.—This well prepared and very fully annotated list,[1] including the observations of several ornithologists for a number of years, is a welcome addition to the bird literature of the Canadian Provinces.

An account of the physical features of the county is given as an introduction and attention is called to the southern position of the region and the consequently large number of southern birds which have been recorded within its limits; the repeated nesting of the Cardinal and of the Gnatcatcher are cases in point.

The authors have produced an excellent list and apart from its value as a reference work the bits of life history and personal experience that are scattered through the text make it pleasing reading to all interested in bird-lore.—W. S.

Other Publications.

Bailey, A. M. and Niedrach, R. J.—Photographing the Western Horned Owl. (*American Forests*, January, 1934.)—Near Denver, Colo.

Bailey, A. M. and Niedrach, R. J.—The Prairie Falcon. (*Louisiana Conservation Review*, January, 1934.)—In Colorado.

Bailey, H. H.—On the Red Phalarope, Audubon's Shearwater and Pomarine Jaeger in Florida. (Bull. No. 8, The Bailey Museum and Library of Natural History. Dated December 15, 1933; mailed March 6, 1934.)

Blaker, G. B.—The Barn Owl in England. (*Bird Notes and News*, Winter, 1933.)—Report on results of the census of these birds. There are estimated to be 25,000 left in England and Wales but they are still decreasing mainly through interference by man but this factor has been less evident than formerly.

Bond, James.—A New Lizard Cuckoo from the Dominican Republic, with Remarks on the Saona Palm Tanager. (*Proc. Acad. Nat. Sci. Phila.*, LXXXV, p. 369, January 8, 1934.)—*Saurothera longirostris saonae* subsp. nov.

[1] History and List of Birds of Middlesex County, Ontario. By W. E. Saunders and E. M. S. Dale. Reprinted from Trans. Royal Canad. Inst., Vol. XIX Part 2, 1933. Univ. of Toronto Press, 1933. Pp. 161–248—index (3 pp.).

Boulton, Rudyerd.—New Birds from Angola. (*Proc. Biol. Soc. Washington*, Vol. 47, pp. 45–48, February, 1934.)—*Numida meleagris bodalyae* (p. 45), *Batis margaritae* (p. 47).

Buswell, W. M.—Great White Herons. (*Florida Naturalist*, January, 1934.)—A nesting colony in late November on the Florida Keys.

Burleigh, Thomas D.—Description of a New Subspecies of Yellow-throat from Georgia. (*Proc. Biol. Soc. Washington*, Vol. 47, pp. 21–22, February 9, 1934.)—*Geothlypis trichas typhicola* (p. 21), Athens, Ga.

Bytinski-Salz, Hans.—On the Nomenclature of Hybrids. (*Internat. Entomol. Zeitschrift*, Jahrgang 47, No. 14, 1933.)—[In German.]

Cairnie, C.—Notes on Birds of the North Atlantic.—(*Scottish Naturalist* January–February, 1934.)—Notes from numerous transatlantic trips.

Carriker, M. A., Jr.—Descriptions of New Birds from Peru, with Notes on Other Little-known Species. (*Proc. Acad. Nat. Sci. Phila.*, LXXXV, 1933, pp. 1–38, March 24, 1933.)—Thirty-four new forms described as a result of his 1932 explorations in Peru, for the Philadelphia Academy.

Chapin, James P.—Up Kenya in the Rains. (*Natural History*, January–February, 1934.)—Many notes on the bird life.

Chapman, Frank M.—A Season's Bird Guests. (*Natural History*, January–February, 1934.)—Intimate study and photography of Florida winter birds on Biscayne Bay, told in a delightful manner.

Danforth, Stuart T.—A New Clapper Rail from Antigua, British West Indies. (*Proc. Biol. Soc. Washington*, Vol. 47, pp. 19–20, February 9, 1934.)—*Rallus longirostris manglecola* (p. 19).

de Schauensee, Rodolphe M.—A New Race of *Caprimulgus asiaticus* from North Siam. (*Proc. Acad. Nat. Sci. Phila.*, LXXXV, February 21, 1934.)—*C. a. siamensis* (p. 373), Chieng Mai.

de Schauensee, Rodolphe M.—A New Race of *Dryobates cabanisi* from the Southern Shan States. (*Proc. Acad. Nat. Sci. Phila.*, LXXXV, 1933, pp. 371–372.)—*Dryobates cabanisi cadwaladeri* (p. 371) Kyu Loi, west of Keng Tung.

de Schauensee, Rodolphe M.—Additions to the Bird Fauna of Siam. (*Proc. Acad. Nat. Sci. Phila.*, Vol. LXXXVI, pp. 3–4. March 8, 1934.)—A list of fifteen species and subspecies new to the country collected on the author's third expedition.

Friedmann, Herbert.—Critical Notes on American Vultures. (*Proc. Biol. Soc. Washington*, Vol. 46, pp. 187–190, October 26, 1933.)—*Cathartes aura teter* (p. 188) described as new from Riverside, Calif.

Greenway, James C., Jr.—Descriptions of Four New Subspecies of Birds from the Huon Gulf Region, New Guinea. (*Proc. New England Zoöl. Club*, Vol. XIV, pp. 1–3. January 25, 1934.)—*Paradisea rudolphi ampla* (p. 1), Mt. Misim; *Parotia lawesi fuscior* (p. 2), Mt. Misim; *Climacteris pacens stevensi* (p. 2), Mt. Misim; *Zosterops minor tenuifrons* (p. 3), Wau, Morobe Dist.

Griscom, Ludlow.—The Ornithology of Guerrero, Mexico. (*Bull. Mus. Comp. Zoöl.*, Vol. 75, No. 10, January, 1934.)—An excellent account of one of the richest faunas of Mexico. The Sierra Madre del Sur here represents the most northern limit of the Subtropical Zone of Central and South America with 21 characteristic forms of which 14 are endemic. The collection which forms the basis of the report was made by W. W. Brown in 1930–32, and added 110 species and subspecies to the hitherto known avifauna. Seven new forms are described from Guerrero and nine from elsewhere. A new genus and species *Amaurospizopsis relictus* (p. 412) was Mr. Brown's most notable discovery; a colored plate of it is presented.

Griscom, Ludlow.—The Pine Grosbeaks of Eastern North America. (*Proc. New England Zoöl. Club*, Vol. XIV, pp. 5–12, February 12, 1934.)—*Pinicola enucleator eschatosus* Oberholser supposed to be peculiar to Newfoundland is shown to be identical with mainland Pine Grosbeaks from northern United States and southern Canada, but as more northern birds prove to constitute a distinct race, *P. e. leucura* (Muller) is restricted to this form and *eschatosus* to the more southern race.

Hallman, R. C.—Notes from St. John County [Florida]. (*Florida Naturalist*, January, 1934.)

Holt, Ernest G.—Playing Big Brother to the Birds. (*Natural History*, January–February, 1934.)—Experiences on the Audubon Society's Bird Sanctuaries by the former Director; beautifully illustrated.

Johnson, R. A.—Some Notes on the Winter Birds of Yarmouth and the Tusket Islands of Nova Scotia. (*Canadian Field Naturalist*, January, 1934.)

Kelso, Leon.—A Note on *Otus sanctae catharinae*. (*Biological Leaflet*, No. 3, 1934.)—Redescribed at length.

Kelso, Leon.—A New Spectacled Owl from Bolivia. (*Biological Leaflet*, No. 2.)—*Pulsatrix perspicillata boliviana*, Carapari, southern Bolivia.

Laskey, Mrs. F. C.—Preliminary Report on Field Sparrow Migration. (*Jour. Tenn. Acad. Sci.*, July, 1933.)—A few were resident but there was a spring migration from farther south of birds "which showed a variation in plumage color from those that had wintered." Unfortunately this difference is not stated. As there is no spring molt in Field Sparrows it is difficult to see how there should be any difference in these two lots of birds.

Lewis, Harrison F.—Some Canadian Audubboniana. (*Canadian Field Naturalist*, December, 1933.)—Interesting letters to Thomas McCulloch, Jr., and a summary of Audubon's Labrador Trip which took place one hundred years ago.

Lewis, Harrison F.—Recent Developments in Waterfowl Conservation in Eastern Canada. (*Canadian Field Naturalist*, February, 1934.)

Canadian Christmas Bird Censuses, 1933.—From various observers. (*Canadian Field Naturalist*, February, 1934.)

Laing, Hamilton M.—Some Vancouver Island Bird Notes. (*Canadian Field Naturalist*, February, 1934.)

Longstreet, R. J.—New Pelican Rookery. (*Florida Naturalist*, January, 1934.)—Moved from Brevard Reserve to an island three miles below the Coast Guard Station on Mosquito Lagoon, Fla.

More Game Birds in America.—Small Refuges for Waterfowl.—An attractive illustrated pamphlet discussing the whole problem of establishing refuges.

Munro, J. A. and Clemens, W. A.—Food of the American Merganser in British Columbia. (*Canadian Field Naturalist*, March, 1934.)—Second paper.

Murie, Olaus J.—Tundra Mothers. (*American Forests*, March, 1934.)—Illustrated account of Steller's Eider and other Alaskan birds.

Nelson, E. W. and Goldman, E. A.—A New Subspecies of the Snail Kite *Rostrhamus sociabilis* (Vieill.). (*Proc. Biol. Soc. Washington*, Vol. 46, pp. 193–194. October 26, 1933.)—*R. s. major* (p. 193) Catemaco, Vera Cruz, Mexico.

Riley, J. H.—Some Additions to the Bird Fauna of Siam. (*Jour. Siam Society Nat. Hist. Suppl.*, Vol. IX, No. 2, 1933.)—A list of seventeen species or subspecies not previously recorded from Siam.

Schaanning, H. Tho. L.—Preliminary Results of International Bird Banding of Norwegian Birds.—Extract from a Journal not indicated.

Shaver, Jesse M.—The Influence of Climatic and Weather Factors upon the Numbers of Birds on a Depositing Creek Bank. (*Ecological Monographs*, pp. 535–597, October, 1933.)—Normal values of seven climatic factors—temperature, relative humidity, precipitation, wind velocity, sunshine duration and atmospheric pressure, compared with curves of bird abundance based on lists made on 74 trips in the neighborhood of Nashville, Tenn. Comparisons are also made for summer residents, winter visitants, etc.

Shaver, Jesse N.—A Bibliography of Tennessee Ornithology. (*Jour. Tenn. Acad. Sci.*, October, 1933.)—A convenient list of 237 titles.

Shaver, Jesse M. and Mrs. Mary B. Roberts.—A Brief Study of the Courtship of the Eastern Cardinal. (*Jour. Tenn. Acad. Sci.*, April, 1933.)—The singing of the female may modify to some extent the territory details presented by the study of other species.

Soper, J. Dewey.—Interesting Bird Records for Southern Baffin Island. (*Canadian Field Naturalist*, March, 1934.)

Squires, Susan K.—Birds and a Bath. (*Canadian Field Naturalist*, January, 1934.)—Bathing in rain, spray and snow.

Lindsay, Robert V.—Notes on the Nesting of the Duck Hawk in Ontario. (*Canadian Field Naturalist*, January, 1934.)

Thompson, Ben H.—In Defense of Pelicans. (*California Fish and Game*. July, 1933.)—An admirable reply to the charges of George Neale, Chief of the Bureau of Fish Rescue and Reclamation, of California, who charged the Pelicans with serious interference with the fish supply.

Every one of his statements on this matter is shown to be absolutely wrong and based upon lack of knowledge of the facts, as is so frequently the case where "game protectors" discuss the economic value of other species.

Wetmore, Alexander.—An Oligocene Eagle from Wyoming. (*Smithson. Misc. Colls.*, Vol. 87, No. 19, December 26, 1933.)—*Palaeoplancus sternbergi* (p. 1).—Somewhat similar to *Aquila* and the larger species of *Buteo*.

Wetmore, Alexander.—Pliocene Bird Remains from Idaho. (*Smithson. Misc. Colls.*, Vol. 87, No. 20, December 27, 1933.)—*Pelecanus halieus* (p. 3), and *Chen pressa* (p. 9), are described as new.

Wetmore, Alexander and Lincoln, F. C.—Additional Notes on the Birds of Haiti and the Dominican Republic. (*Proc. U. S. Nat. Mus.*, Vol. 82, Art. 25, 1933.)—An account of a field trip by the authors, March to May 1931, with a well annotated list of species observed and with special lists for Isle a Vache and Beata Island. Two new forms were discovered on this expedition both of which the authors have previously described i. e. *Phaenicophilus poliocephalus tetraopes* and *Microligea palustris vasta*. There are a number of photographs of the region traversed.

Walker, Lewis Wayne, and Young, A. Spotswood. Humming-bird Haven. (*Natural History*, March–April, 1934.)—An interesting account of photographing Hummingbirds and their nests in southern California, with excellent illustrations. Curiously enough we fail to find in the text any mention of the species studied but as two of the photographs are labelled "Costa Hummingbird" we presume that that was the one, although three species are mentioned as being present.

The Ornithological Journals.

Bird-Lore. XXXVI, No. 1. January–February, 1934.

Familiar Birds in Their Winter Homes. By Alexander F. Skutch.—Interesting account of the winter birds of several localities in Central America.

Help the Bluebirds. By T. E. Musselman.—Modern tree culture has deprived the Bluebirds of their natural nesting places in holes in dead trunks, while intensive agriculture has done away with rail fences, another nesting site. Suggests putting up Bluebird boxes of a type found very satisfactory and which is described in detail. Of 22 boxes erected last year 18 were occupied and 88 of 93 young matured.

The Christmas bird census takes up most of the number. Cape May, N. J., and the Bronx Region, N. Y., led in the East with 96 species each, and Santa Monica, Calif., in the West, with 156.

The Veery and Some of his Family are discussed by Dr. A. A. Allen in his usual attractive style.

The Condor. XXXVI, No. 1. January–February, 1934.

A New Species of Hummingbird, Genus *Chaetocercus*, from Eastern

Ecuador. By Robert T. Moore.—*C. cleavesi* (p. 1) Baeza, Ecuador. With a color plate from a painting by W. A. Weber.

Field Observations from Echo Lake California. By Dudley S. De Groot.

Some Early Summer Food Preferences of the American Raven in Southwestern Oregon. By A. L. Nelson.—A wide range of food of which young rabbits formed the largest item, 34%.

In Memoriam: George Frean Morcom. By Harry S. Swarth.

An Abnormal Little Flycatcher. By Walter W. Bennett.—A partially albinistic female with a normal male reared one normal young; two eggs proved infertile.

Remarks on the Proposed Races of *Squatarola squatarola* and Comments on the Nomenclature. By James L. Peters.—Considers that from a study of material now available there is only one form of the Black-bellied Plover. The names applied to the Siberian bird are discussed in detail.

A Fossil Quail from Nebraska. By Alexander Wetmore. *Crytonyx cooki* (p. 30).

The Wilson Bulletin. XLV, No. 4. December, 1933.

Ways of the Black Skimmer. By Ivan R. Tomkins.

A Ten-year-old Cardinal. By A. F. Ganier.—A banded bird.

Experiments on the Digestion of Food by Birds. By James Stevenson.—First voided excrement in certain passerine birds, from a full stomach, appears in an hour and a half; the last in two hours and a half. Some grain feeding birds consume daily 9.6 times their weight. The survival time of small passerine birds without food is relatively short, even in favorable temperature.

The Breeding Birds of Ashtabula Co., Ohio. By Lawrence E. Hicks.

The Cardinal. III, No. 7. January, 1934.

The Future of the Ecology of Pymatuning Swamp. By M. Graham Netting and William R. Van Dersal.—Due to flooding a large part of the swamp by converting it into a reservoir.

The American Egret in Summer. By Bayard H. Christy.

Bird-Banding. V, No. 1. January, 1934.

The Migratory Movements of Certain Colonies of Herring Gulls in Eastern North America. By R. J. Eaton.

Distribution and Seasonal Movements of the House Sparrow. By John T. Nichols.

Nest Distribution and Survival Ratio of Tree Swallows. By Seth H. Low.

Observations of the Nesting Habits of the Black and White Warbler. By W. P. Smith.

Shorebird Banding on Cape Cod. By Maurice Broun.—Fourteen species, 2759 individuals, trapped, during 47 days.

Bluebird Studies on Cape Cod. By Seth H. Low.

The Oölogist. L, Nos. 10–12. October–December, 1933.

Crow Slaughter (October and November). A photograph of 5000 Crows feet is published which were accepted as admissions to a motion picture house at Camrose, Alberta, in an effort to check "the destruction of many thousand eggs of water fowl and waders," according to the editor. We are still unconvinced that Crow destruction is warranted except in definite instances. Destruction of water fowl eggs has been mainly if not entirely restricted to our Atlantic coast where the culprit is the Fish Crow.

The Piping Plover. By P. B. Peabody. Nesting at Devil's Lake, N. D.

The Nebraska Bird Review. II, No. 1.

Twenty-one Years of Bird Study at Red Cloud, Neb. By J. M. Bates.

The 1933 Migration Season.—An excellent review.

There is an extended obituary notice of the late Robert H. Wolcott.

Iowa Bird Life. III, No. 4. December, 1933.

Iowa's Vanished Hosts. By E. D. Nauman.—Deals with the Passenger Pigeon.

The Early Iowa Bird Magazines. By Fred J. Pierce.

The Migrant. IV, No. 4. December, 1933.

Notes on the Painted Bunting at Memphis. By Ben B. Coffey.

Notes on Duck Hawk Nestings. By F. M. Jones.

Many local notes on Tennessee birds.

The Gull. XV, Nos. 10–11. October and November, 1933; XVI, Nos. 1 and 2. January and February, 1934.

Birding around Salt Lake City, Utah. By C. W. Lockerbie. (October.)

Christmas Censuses for San Francisco and Yosemite (January).

Census of Oakland Water Fowl (February).

Numerous notes on San Francisco birds.

The Raven. IV, Nos. 10–11 and 12. October–December, 1933, and V, No. 1. January, 1934. (Mimeographed.) Virginia bird notes.

Summer Birds of Mountain Lake. By R. F. Carroll. (October.)

A Sketch of the Water Fowl Population of the Potomac River During the Fall. By W. B. McIlwaine, Jr. (December.)

The Flicker. V, No. 4; VI, No. 1. December 1933 and January, 1934. (Mimeographed.)

Bird notes from Minnesota.

Snowy Egret. VIII, No. 2, Winter, 1933. (Mimeographed.)

Bird notes from Michigan, including several excellent lists.

News from the Bird Banders. VIII, No. 4. November, 1933. (Mimeographed.)

Bird banding data from southern California including a paper on 'The Homing Instinct.' By E. L. Sumner, Jr.

Saint Louis Bird Club Bulletin. III, No. 2. February, 1934. (Mimeographed.)

St. Louis, Missouri, notes.

The Night Heron. I, Nos. 1 and 2. January and February, 1934. (Mimeographed.)

St. Louis, Missouri, bird notes.

The Ibis. (13th ser.). IV, No. 1. January, 1934.

Lynes-Vincent Tour in Central and West Africa in 1930–31. Part II. By H. Lynes and W. L. Sclater.

The Relation Between Plumage and Environment with Special Reference to the Outer Hebrides. By R. Meinertzhagen.—Points out many instances of dark colored birds in regions of light rainfall and vice versa, and suggests that rainfall has perhaps nothing to do with depth of color of plumage but that possibly the action of the ultra violet ray may be responsible, and that saturated atmosphere may affect the strength of the latter.

In the outer Hebrides the rainfall is lighter than in western Scotland and Ireland but many of the birds are darker. Four of these dark races are here separated as distinct subspecies.

Birds of the Southern Sahara and Adjoining Countries in French West Africa Part II. By George L. Bates.

An Unusual Goose of the Type *Anser neglectus* in Scotland. By John Berry.

Review of Two African Species—*Cyanomitra olivacea* and *Batis molitor*.—By Jack Vincent.—Distribution of races discussed and four new subspecies of the former are described.

A Contribution to the Ornithology of Chinese Turkestan Part IV. By F. Ludlow and N. B. Kinnear.

The Birds of Northern Portugese West Africa Part II. By Jack Vincent.

The Desert Element in the Avifauna of the Astrachan Steppes. By K. A. Vorobieff.

On the Dates of Pallas's 'Zoographia Rosso-Asiatica.' By C. D. Sherborn.—Confirms the dates of 1811 for volumes 1 and 2 and 1814 for volume 3.

In Short Notes *Larus taimyrensis armenicus* (p. 171) is described as new from Lake Gokcha, Transcaucasia, by S. A. Buturlin.

Bulletin of the British Ornithologists' Club. No. CCCLXXIII. January 1, 1934.

Major Hingston discussed 'The Meaning of Animal Colour and Adornment.' He contended that color and adornment were directly connected with the threatening attitude of fighting, and not with sex attraction, and explained molt as a change corresponding to the change from an aggressive bird at breeding time to a passive one in winter (cf. A. A. Allen *antea* p. 180.)

G. Carmichael Low described a visit to Shetland and Orkney.

There are reviews of the African races of *Falco tinnunculus* and *Milvus migrans* by C. Grant and Mackworth Praed.

Finn Salomonsen describes three new races of birds from the Moluccas.

Bulletin of the British Ornithologists' Club. CCCLXXIV. January 27, 1934.

W. L. Sclater reviewed the forms of *Sigmodus scopifrons* and C. B. Ticehurst described *Phylloscopus armandii perplexus* (p. 96) from south-

western Szechuan, and J. Delacour proposes *Pitta soror petersi* (p. 97) for *P. s. intermedia* preoccupied.

British Birds. XXVII, No. 7. December, 1933.

Vipers Preying on Young Birds. By M. V. Wenner.—With photographs showing the attack of the snake and the swallowing of its victim.

Territory Reviewed. By David Lack.—A lengthy discussion in which the author claims "that so far sufficient evidence has not been adduced to show that territory is a general law of bird life, and that there is no proof that territory is of food value, nor is an important factor in the prevention of overcrowding."

British Birds. XXVII, No. 8, January 1, 1934.

On the Breeding Habits of the Puffin. By R. M. Lockley.—Illustrated.

Obituary: Ernst Johann Otto Hartert. By H. F. Witherby and F. C. R. Jourdain.—With portrait.

British Birds. XXVII, No. 9. February, 1934.

Recovery of Marked Birds.

On Some Breeding Habits of the Pied Flycatcher. By C. V. Llewelyn.

Breeding Habits and Numbers of Kingfishers in Renfrewshire. By R. L. Brown.

The Oologists' Record. XIII, No. 4. December 1, 1933.

December in the Argentine Pampa. By C. F. B.

Some Observations on the Nesting of the Stone Curlew (*Burhinus oe. oedicnemus*). By D. Nethersole-Thompson.

The Avicultural Magazine. XI, No. 12 and XII, Nos. 1 and 2.

Notes on New Zealand Birds. By Sydney Porter. (December and January.)

Some Notes on a Collecting Trip in Kenya. By C. S. Webb. (January.)

Notes from a Chicago Aviary. By Karl Plath.—An illustrated account of the author's collection. (February.)

There are colored plates of *Eupetomena macroura* and *Chrysolampis mosquitus* (December) and *Cinnyris venustus falkensteini* and *Drepanorhynchus reichenowi* (January), and the usual valuable information about breeding birds in captivity.

The Emu. XXXIII, Part 3. January, 1934.

This issue is mainly devoted to the thirty-second Annual Congress of the R. A. O. U., held at Sydney, October 23–24, 1933, followed by the usual Camp-out held this time at Moree, New South Wales. Some forty members attended and were cared for in twenty sleeping tents and a dining tent. 142 species of birds were observed of which there is an interesting account by C. E. Bryant, illustrated by sixteen photographic bird pictures taken during the camp.

The address of the retiring president, Mrs. Perrine Moncrieff, deals with 'Birds in Relation to Women' and is an admirable, and we think unique, summary of the subject, tracing woman's association with birds in pagan times and from the middle ages to the present, in matters of

dress, ornament and food; as pets, in falconry and in writings; by women—a paper well worth reading by members of the other "Ornithologists' Unions"—both women and men!

Other articles are:

Grey-headed Robin (*Heteromyias cinereifrons*). By George Mack; with a color plate from painting by Cayley.

The Food of *Platycercus eximius* and *P. elegans*. By A. E. Bridgewater.

Notes on the Large-tailed Nightjar. By A. J. Marshall.

On the Potentiality of Guano Production in Australia. By A. H. E. Mattingley.

The South Australian Ornithologist. XII, Nos. 4 and 5. October, 1933, and January, 1934.

A Great Flight of the Mutton-Bird (*Puffinus tenuirostris*). By J. Sutton. (October.)

The Nesting of the Pained Snipe (*Rostratula australis*). (January.)

Also numerous local lists for South Australia.

Alauda. III, No. 3. July–September, 1933. [In French.]

First Mention and Original Descriptions of Certain Birds of the Province of Quebec. By D. A. Dery.—An interesting historical résumé; read at the Quebec meeting of the A. O. U.

On Some Aspects of Avian Psychology. By Maurice Thomas.—Discusses migration, the refraction of light rays, the instinct of aquatic birds, etc.

The Parroquets of the Genus Psittacula. By R. Snouckaert van Schauburg.—A systematic review of thirty-five forms recognized by the author.

Contributions to the Ornithology of Russia. V. The Geographic Variation of *Strix aluco*. By G. Dementieff.—*S. a. siberiae* (p. 339) from Tobolsk, western Siberia, is described as new.

Notes on Certain Corvidae. By Noel Mayaud.—A monographic consideration of *Coloeus monedula*, and *Pica pica* as they occur in France.

On the Systematic Position of *"Bubo" doerrisi* Seebohm. By G. Dementieff.—Should be known as *Ketupa zeylonensis doerrisi*.

L'Oiseau. III, No. 4. 1933. [In French.]

Revision of the Genera *Euplectes* and *Vidua* (Continued). By J. Delacour and F. Edmond-Blanc.

Systema Avium Rossicarum. By S. A. Buturlin and G. P. Dementiev (Continued).—This review of the birds of Russia begins the Passeres in this issue.

A Critical Note on the Subspecies of *Goura victoria*. By E. Mayr and J. Berlioz.—*G. victoria victoria* and *G. v. veccarii* are the two recognizable forms.

The Birds of Kwangsi. By K. Y. Yen.—Continued.

New Geographic Races of *Passer montanus* from Central Asia. By W. Stachanow.—*P. m. pallidissimus* (p. 789) Harma Bourong, eastern Tzaidam; *P. m. gobiensis* (p. 790) southern Gobi.

Critical Revision of the Hummingbirds of the Genus *Saucerottia*. By J. Berlioz.—Twenty-four forms recognized, arranged in nine species. Many local notes.

Journal für Ornithologie. LXXXII, Heft 1. January, 1934. [In German.]

On the Natural History of the Song Sparrow. By Margaret M. Nice.—(Concluded).

Ornithological Observations on an Argentine Estancia. By H. Krieg.

There is also a tribute to the late Ernst Hartert and an account of the annual meeting of the German Ornithological Society. Cf. also p. 264 *antea* for notice of Sonderheft.

Ornithologische Monatsberichte. XLII, No. 1. January, 1934. [In German.]

A Contribution to our Knowledge of the Bird life of the Bulgarian Mountains. By Bernhard Rensch.

On Species Hybrids in Palaearctic Sparrows. By W. Meise.—*Passer d. domesticus* × *P. m. montanus;* and *P. hispaniolensis* × *P. domesticus.*

New forms are described as follows: *Parisoma lugens clara* (p. 16) Matengo Highlands, and *Ploceus aureoflavus reicherti* (p. 16) Mbamba-Bai, German East Africa, both by W. Meise. *Pachycephala pectoralis neuhausi* (p. 24) Island of Sinabiet, Lihir Archipelago, by E. Stresemann. *Xema sabini palaeartica* [sic] (p. 25) Taimyr-See, by B. Stegmann.

Der Vogelzug. V, No. 1. January, 1934. [In German.]

On the Physiology of the Migratory Movement. By H. Schildmacher.

The Mass Invasion of Waxwings in Middle Europe in 1932–33.

The 1933 Stork Experiments at Rossiten. By Ernst Schüz.

Beiträge zur Fortpflanzungsbiologie der Vögel. X, No. 1. January, 1934. [In German.]

Observations of the Little Rail *Porzana parva.* By Paul Ruthke.

The Pairing and Breeding Biology of the Penduline Titmouse (*Remiz pendulinus*). By Otto Steinfatt.

Breeding Notes from the Writings of N. A. Sarudny. By H. Grote.

Le Gerfaut. XXIII, Fasc. 3 and 4. 1933. [In French.]

Ornithological Observations in Belgium from May 1932 to May 1933. Compiled by G. van Havre (Fasc. 3).

On the Avifauna of the Basin of Angara [eastern Siberia]. By W. N. Scalon, and A. A. Sludsky (Fasc. 4).

Der Ornithologische Beobachter. XXXI, Heft. 3, 4 and 5. December, 1933, January and February, 1934. [In German or French.]

On the Avifauna of the Camargue. By Hans Hess.—Another contribution to this favorite subject. (December.)

On the Bird Life of Mallorca. By Dr. Lenz. (January.)

Winter Observations for 1933 in Neeracherried, Zurich. By Julie Schinz.

Ardea. XXII, Afl. 3–4. December, 1933. [In Dutch, German or English.]

On the Theory of Flight Lines. By Geyr von Schweppenburg. [In German.]

On the Breeding Colonies of the Black Tern (*Chlidonias n. niger*) in Holland. By Fr. Haverschmidt.—With excellent photographs.

Cyornis caerulata albiventer (p. 105)—A new subspecies from Sumatra. By G. C. A. Junge. [In English.]

Ornithological Observations in the Camargue. By G. J. van Oordt and A. A. Tjittes.—Still another contribution to this subject with a list of all species hitherto recorded and a bibliography of some of the published papers. [In English.]

Caterpillar-eating and Caterpillar Extermination by Birds. By Aug. Spennemann. [In German.]

Organ of the Netherlands Ornithological Club. VI, No. 3. January, 1934. [In Dutch.]

Bird Migration over the Netherlands. By W. H. van Dobben and G. F. Makkink.

A Consideration of Wing Formulae. By C. Eykman.—With diagram showing method for graphic indication.

On *Pristorhamphus*. By Mr. Dr. R. C. E. G. J. Baron Snouckaert van Schauburg.

Also many notes on birds of the Netherlands.

Ornis Fennica. X, No. 3–4. July–December, 1933. [In Finnish or German.]

Migration in Mallards.—Further account of the Mallards hatched in Finland from English eggs (where the bird is resident) and which behaved as typical migratory birds, leaving Finland and many of them returning the following year. Some were taken in the winter in France and other parts of western Europe. [In German.]

Bird Constancy of two Groves with Remarks on the Brood-return Theory and on the Quantative Method of Taking a Bird Census. By P. Palmgren. [In German.]

Danske Fugle. IV, No. 28, 1933. [In Danish.]

The Storks of Denmark. By P. Skovgaard.—An illustrated article on *Ciconia c. ciconia* in Denmark.

Duck Banding in the Province of Leningrad. By G. Doppelmair.

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CORRESPONDENCE.

Editor of 'The Auk':

May I suggest to your readers as an unusually interesting subject for field-study the inter-relationships of breeding Purple and Bronzed Grackles in any part of that area, from Massachusetts to Louisiana (and probably Texas), where these two species hybridize.

When I began a study of these birds, forty-odd years ago (Bull. Amer. Mus. Nat. Hist., Vol. IV, 1892, pp. 1–20), transportation facilities were comparatively limited and I had but few specimens and fewer field-notes from the region mentioned. Today, the field-student with a motor car at his command, defies distance. I hope, therefore that he will defy it early during the coming breeding season and visit Grackle colonies anywhere in the region I have referred to, but especially in the lower Mississippi Valley and more especially in southwestern Louisiana and northeastern Texas.

Full series of males should be secured and when the collector has finished his own researches, I should be greatly obliged if he would loan these birds, and any other pertinent material to me for resumption of the studies I began in 1891 and continued at the last A. O. U. meeting.

Yours truly,
FRANK M. CHAPMAN.

American Museum of Natural History,
New York City,
February 14, 1934.

[While heartily endorsing Dr. Chapman's plea we should like to add a request that Louisiana Grackle students also collect a few adult male Boat-tailed Grackles and ascertain definitely the color of their eyes. 'The Auk' has already devoted a considerable space to this subject without any satisfactory conclusion being reached and the end is not yet! (cf. p. 265 *antea*)—Ed.]

Editor of 'The Auk':

At the risk of being regarded a nuisance for reiterating my plea for a revision of the vernacular specific names for birds I make some comments on the correspondence and editorial remarks on page 128 of the January 'Auk.'

Mr. Swarth regrets that an author has used the term "White Herons" instead of a more specific designation in reference to some birds recorded by him on sight evidence. He remarks,—"I do not doubt that the author knew what the birds were. . . ." From the context I should conclude just the contrary and should regard the indefiniteness of the record as commendable scientific caution. The author is quite within his rights

and his clear duty in restricting his evidence within the facts as he ascertained them. The occurrence of some species of white-colored Herons at the time and place seemed to him, and apparently to the Editor, of sufficient interest for mention. Had he identified them farther than circumstances justified the action would have been reprehensible. That this vagueness causes indexing difficulties is too bad but not as bad as if he had jumped at unwarranted conclusions. To a layman in indexing it does not seem more difficult to index an indefinite "Heron,—white" than a definite "Heron,—Great Blue or Green."

Mr. Swarth also calls attention to the use of "Egret" without further specific designation. The Editor points out that the 1910 Check-List restricts this term to *Casmerodius egretta*, and infers that to this species such reference should be applied. To this conclusion, under these circumstances, I take strong exception. Unless the author makes such intention plain, I see no justification, the A. O. U. Committee to the contrary notwithstanding, in assuming this artificially restricted meaning to an obviously proper group name. *Egretta candidissima and Dichromanassa rufescens* by the same check-list, and other species by common usage and equal authority, are also properly "egrets." To deny the name to them is absurd and a refusal to recognize the self-evident. There is a perfectly legitimate and often necessary use for the group name "egret" and the attempt to restrict it to one species is not only an incorrect use of words but bad ornithology. There are numbers of similar cases in the 'Check-List.'

This, with other questions as to the application of vernacular names that have been raised lately especially in census and banding operations in which non-systematists are preeminent, is demonstration of the need for a revision of this department of our official nomenclature. The difficulties of constructing an acceptable and consistently correct system of English names for all our species and subspecies are admitted, but the need is great, growing more pressing, and will eventually have to be faced.

It has been found expedient to prepare such a list for use in a popular work on the birds of Canada now going to press in which the interest is primarily specific but for which no specific nomenclature has been officially provided. We have had to use our own best judgment in the matter but how general the approval of the results will be remains to be seen. Under the circumstances, and without the assistance of the combined wisdom of the A. O. U., no other course was open. Until the A. O. U. takes this matter seriously and settles the difficult points, those of us who wish to be as free and as accurate in the popular tongue as we can be in the scientific must follow our own individual judgments with many differences of opinion.

National Museum of Canada.
Ottowa, Canada.
Feb. 22, 1934. P. A. Taverner.

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[While it may be foolish to continue a discussion that has proven fruitless in the past, we must point out for Mr. Taverner's benefit that the editor stated that "*in January, 1931*," (i. e. in the 3rd edition of the Check-List) "Egret" was the recognized name for the "American Egret." In preparing the 4th edition the Committee endeavored to correct the very fault now again brought up by Mr. Taverner and added "American" to the English name of *Casmerodius a. egretta* so that all the species that he mentions now enjoy the name Egret while each one has a distinctive qualifying name, just as he would have it!

Apart from other such additions to names in the 3rd edition as "Eastern" for the Robin and other species with two or more races, the Committee refrained from changes as it was recognized that our only hope for uniformity was to stick so far as possible to the names already established in the 'Check-List.' We have yet to see any approach to uniformity on the part of the critics of our present English bird names and until then there is little hope for anything but diversity of opinion among the critics while the rest of us stick to the old names. As to specific group names we must first stop the constantly shifting ideas as to which forms are species and which subspecies which is an apparent impossibility. But why should our system of vernacular names be reduced to a set of arbitrary rules as is our technical nomenclature? If two birds like the Boat-tailed and Great-tailed Grachles, which have long had these distinctive names, are considered to intergrade, why should we have to abandon these names for one applicable to both?—Witmer Stone.]

OBITUARIES.

JUST as we go to press we learn with the greatest sorrow of the death of Ruthven Deane, on the morning of March 20, 1934, at his home in Chicago. Few, if any Fellows of the Union were more widely known or more beloved than Ruthven Deane. While not engaged in active ornithological work in recent years, he maintained a deep interest in the history of ornithology and of ornithologists, while the welfare of the American Ornithologists' Union was ever uppermost in his mind. He had served for years on both the Council and the Finance Committee and no meeting seemed quite successful without his genial presence.

For many years he had kept up a voluminous correspondence with leading members of the Society in all parts of the country and they came to rely upon his delightful newsy letters for information as to what was going on elsewhere. The service which he rendered in this way he probably never realized. Always loyal, cheerful and sympathetic, with a keen sense of humor, and ever the perfect gentleman and lovable friend, he occupied a niche in the Union which no one can fill.—W. S.

ROBERT WILSON SHUFELDT, U. S. A., a Founder and Retired Fellow of the American Ornithologists' Union, died after a long illness at Washington, D. C., Jan. 21, 1934, at the age of 83. He was the son of Rear Admiral R. W., and Sarah H. Shufeldt, and was born in New York, December 1, 1850. He graduated from Cornell University in 1871 and took his medical degree at Columbia, now George Washington University, in 1876. Shortly after, he was appointed first lieutenant in the Medical Corps of the Army and promoted to Captain in 1881. After several details in Wyoming he was assigned to Fort Wingate, New Mexico, where he remained nearly five years. In 1891 he was retired for disability, but during the war was restored to active service with the rank of Major and assigned to duty at the Army Medical Museum. He was finally retired January 9, 1919.

Dr. Shufeldt was one of the most voluminous writers in the ranks of American ornithologists. His bibliography published in the 'Medical Review of Reviews' in 1920 included 1565 titles, which relate to all phases of ornithology and include many medical and general articles as well as popular contributions on natural history. His main ornithological publications relate to anatomy and include a number of descriptive papers on osteology, a volume on the 'Myology of the Raven,' and an account of the anatomy of the last living specimen of the Passenger Pigeon. He prepared the plate illustrating the anatomy of the common pigeon which forms the frontispiece of the second edition of Coues' Key. Shufeldt was a pioneer in photographing birds and in several articles in 'The Auk,' beginning in 1887, called attention to the value of photography in orni-

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thological work. In later years be became interested in fossil birds and published several papers on avian paleontology, including descriptions of a number of extinct species.

In accordance with custom a memorial prepared by one of the Fellows will be presented at a future meeting of the Union.—T. S. P.

Ernst Johann Otto Hartert, elected an Honorary Fellow of the American Ornithologists' Union in 1902, died in Berlin-Südende, after a few days of illness on November 11, 1933, shortly after his seventy-fourth birthday. He was one of the greatest ornithologists of all times and his death will be mourned by the whole ornithological world.

Hartert was born in Hamburg on October 29, 1859, and spent his childhood and youth in various parts of Germany (Hamburg, Silesia, Eastern Prussia, and the Rhine Province). Hunting and the intimate study of nature prepared him for his great task in life. The years of study were followed by years of travelling and exploring. From 1885 to 1892 he took part in three expeditions, one to West Africa (Niger and Benue Region), one to the East Indies (Sumatra, Malay Peninsula, and British India), and one to the West Indies and Venezuela. The results of his explorations he published in numerous scientific papers and in a charmingly written and highly informative book: 'Aus den Wanderjahren eines Naturforschers' (From the 'Novit Zool.,' 1901 and 1902).

In 1890 he undertook the cataloguing of the famous bird collection of the Senckenberg Museum and in 1891 he was called to London to complete the 16th volume of the 'Catalogue of Birds' (Swifts and Goatsuckers). Here he met Dr. Günther, the head of the zoological department of the British Museum, who was so taken by the energy and ability of the young man that he recommended him to the Hon. Walter Rothschild as the best candidate for the direction of his new Museum in Tring.

Hartert took over the new position of director of the Rothschild Zoological Museum at Tring (Herts) in the fall of 1892—a position he held for 38 years, thus starting the most productive period of his life. With great persistence and the harmonious coöperation of Lord Rothschild he built up a collection which was not only by far the largest private bird collection of the world, but also better balanced and representative of the bird fauna of the whole world than the collection of any other museum. Although the annual accessions were tremendous, every collection was worked up immediately after its arrival, an unparalleled example to other similar institutions. Hartert himself was an indefatigable collector, who tore himself away from his scientific work whenever he could, to spend a few months collecting in northern Africa or some other favored spot. He made beautiful skins and was very particular about their labelling. His collectors had a world-wide reputation for the beautiful and well-labelled collections they sent to Tring, a fact which was quite a puzzle to some of his

colleagues. I, as one who has collected for Hartert, can unveil the secret. Hartert was in constant touch with his collectors; he sent them advice, suggestions, and encouragement with every mail, but he was amply rewarded for this interest.

The wonderful collections at his disposal enabled him to write an amazing number of treatises on the taxonomy of birds. In 1903 he began his monumental work, 'Die Vögel der paläarktischen Fauna.' This work, which he completed in 1922, will always be one of the classics of ornithological literature. It was the first ornithological work in which the modern principles of classification (broad genera and consistent application of trinomials for geographical representatives) were rigorously applied. It is still today the "bible" of the Old World ornithologist, and it is primarily responsible for the unparalleled development of Old World ornithology during the last generation.

Hartert did not restrict his interest to the Palaearctic Region, but did equally good work on birds from South and Central America, the African, Indian, Papuan, Polynesian and Australian Regions. He combined a universal knowledge of birds, probably not equalled by any ornithologist now living. It was not a superficial knowledge, however, but a mastery of any subject he took up. He was the outstanding authority on Australonesian birds, which were his particular love. In one of his last letters he wrote me: "I am again occupied with revising Palearctic birds and I don't work any longer with New Guinea birds, which nevertheless are for me the altogether most interesting ones, after those from the Solomon Islands." (Dec. 27, 1932). His interest was not restricted to taxonomy, but comprised many subjects of ornithology (particularly oology, and the study of life-history); he had a fine collection of Carabidae, and was also much interested in other branches of natural history. His working capacity was gigantic. Aside from his administrative duties as director of a flourishing museum, and the labor of a vast correspondence, he edited a journal, 'Novitates Zoologicae,' to which he was the main contributor. A bibliography of his writings would fill many pages, and the number of new birds described by him (many in joint authorship with Lord Rothschild) is much more than one thousand.

The new principles of classification advocated by Hartert found at first very little favor with the "old school" on the Continent and in England. "That a foreigner should have achieved so great a success in so heretical a mission in Great Britain, where . . . . his views met with great opposition at first from most of the older and most influential ornithologists of the time . . . . , tells more than any words of the strength of character, the tenacity of purpose and the soundness of judgment Hartert brought to his task, and these traits were reinforced by intense sincerity and keenness, a constant readiness to help and advise, as well as by an original and very likeable personality" (Witherby, 'Nature,' 1933). American ornithologists who, at that time, already largely employed trinomials, were the

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first to appreciate his work. The American Ornithologists' Union elected him a Corresponding Fellow in 1891, and an Honorary Fellow in 1902, in recognition of his merits. Soon he was an Honorary Fellow of all the ornithological societies of the world. In 1904 he received the Honorary Doctor's degree of Marburg University. On his seventieth birthday a "Festschrift" was published in his honor by the German Ornithologists' Society, to which ornithologists from all parts of the world contributed papers, and the British Ornithologists' Union, of which he was Vice-President for some years, presented him with the Godman-Salvin gold medal. In the spring of 1930 he retired from his position at the Tring Museum, and took up residence in Berlin. He was given a study-room at the Zoological Museum and worked there regularly to within three days of his death. His last ambition was to bring his 'Vögel der paläarktischen Fauna' up to date; he had finished three parts of the supplement volume. A month before his death he returned to the hunting grounds of his happy youth to attend an annual meeting of the German Ornithological Society in Eastern Prussia. On this occasion he was elected Honorary President of the Society.

All his life he was anxious to further international goodwill and coöperation. In 1905 he was Secretary of the Fourth International Ornithological Congress in London, and after the war he revived the International Ornithological Congress and was elected its President at Copenhagen in 1926, a task for which he was particularly fitted owing to innumerable international acquaintances, and his fine personality.

This is not the place to give an extensive appreciation of his great personality; detailed obituaries have appeared in the European ornithological journals. A few words from one who had the privilege of knowing him will have to suffice.

Hartert combined a wonderful kindness with great sincerity. He fought courageously for anything he had found true, be it a minor detail of nomenclature or a basic principle of classification; but still he made no enemies, owing to his lovable and cheerful personality. He was most generous and reliable in his advice to fellow-workers, and never tired of training young ornithologists once he noticed that they were really enthusiastic about our science. Many of the leading ornithologists of today were "made in Tring."

Life was not always kind to him; he lost his only son during the war, and he had to witness the end of the great institution he had built up. He bravely overcame all these sorrows and enjoyed the eve of his life at the side of his faithful and understanding wife. Death came suddenly, but it cannot destroy the lasting impression Hartert has made on ornithological science and the picture he has left in the hearts of his friends.—Ernst Mayr.

Obituaries:—H. F. Witherby, 'Nature,' 1933, p. 846; H. F. Witherby and F. C. R. Jourdain, 'British Birds,' 1934, p. 224; L. v. Boxberger,

Beitr. zur Fortpfl., 1934, p. 26; E. Steinbacher and E. Stresemann, Journ. f. Ornith., 1934, p. 169.

CHRESWELL JOHN HUNT, an Associate of the American Ornithologists' Union died after a lingering illness, on October 18, 1933. He was born September 16, 1880, at Vineland, N. J.; his parents, Joseph and Henrietta Jones Hunt being of English and Welsh stock respectively. His father died when Chreswell was but ten years old and his mother moved to Philadelphia. Here the boy attended public school to what good effect may be seen in the literary quality of his writings, although this was probably due in part to his persistent reading, one of his favorite authors being Stuart Edward Wright, whose love of nature is contagious and doubtless influenced young Hunt's after life.

Graduating from the public school Chreswell was apprenticed to a printer and learned that trade well although his interests even at that time where wholly in the outdoors. In 1902 he came to the Academy of Natural Sciences in Philadelphia and inquired of Dr. Witmer Stone if he might contribute migration records to the Delaware Valley Ornithological Club which held its meetings at the Academy and was seeking additional recorders of migration phenomena. "I was much impressed" writes Dr. Stone by his earnestness and care in making his observations and not only accepted his assistance but invited him to join the Club." He was elected on October 16, 1902, and in the same year became an Associate of the American Ornithologists' Union. He was one the of most active members of the D. V. O. C. serving as Secretary from 1907 to 1909, when he removed from the city. He was also a member of the Wilson and Cooper Ornithological Clubs and after removing to Chicago was an organizer and Vice President of the Chicago Ornithological Club, member of the Kennicott Club and a Director of the Illinois Audubon Society.

In association with a fellow member of the Delaware Valley Club he built a cabin on Pensauken Creek, New Jersey, across the Delaware River from Philadelphia, which he named "Domus palustris" and there maintained a row boat in which he explored the surrounding tide water marshes at all seasons and at all times of day and night, learning the habits of their avian inhabitants. He also engaged in tramps through the famous New Jersey pine barrens, and spent much time on the Maurice River in the southern part of the state, at the home of some bird-loving friends. Hunt never collected birds his sole interest being the study of the living bird in its natural environment and his earnestness and persistence in this line of investigation rendered him quite as accurate an ornithologist as those who depended upon the specimen in the hand.

During his Philadelphia residence Hunt was most prolific in his writing though he continued to publish the results of his studies after removing to Chicago. He contributed to 'Cassinia,' the annual of the D. V. O. C., as well as to 'The Auk,' 'Bird-Lore' and the 'Wilson Bulletin,' and we find in all some 33 titles in his bibliography. One is struck by the high literary

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quality of his contributions and his attractive style of composition. His 'Pensauken Diary' and 'Some Birds of a Maurice River Farm' (Cassinia, 1907 and 1908) strongly remind one, in their chatty and slightly philosophical style, of Thoreau or Bradford Torrey, while his little sketch 'The Bird to the Bird Lover' (Bird-Lore, 1905) is one of the best explanations of what bird study means to the ornithologist, that we know.

Moving to Chicago in 1909 Hunt entered the Van Trump Testing Laboratories, in which he worked himself up to the position of chemical engineer in testing asphalt for road construction. His work later took him afield and while superintending construction in Arkansas he found time to gather data for some interesting and valuable papers on the birds of that state, which were published in 'The Auk' in 1921 and 1931. He also visited Biloxi, Miss., on vacations, when he felt the need of more out door life, and contributed to our knowledge of the birds of this region (Auk, 1923, and 1929). Hunt was married on February 15, 1911, to Florence Smith and they had two sons, Chreswell Hedley and Witmer Smith Hunt.

Never of a robust constitution, Hunt four years ago began to show signs of the fatal malady that finally carried him off, heart trouble and arteriosclerosis. He kept at his work, however, until he fell from his chair and had, in November, 1932, to be removed to a sanitorium in Chicago. Here he recuperated sufficiently to be taken to a farm near Elkhorn, Wisconsin, in the spring of 1933. Here he was once more able to be among the birds and to enjoy to the full their study until the last migrants began leaving for the south.

While still apparently as well as usual he suddenly collapsed, one morning, at the breakfast table, and died instantly.

Chreswell Hunt was one of many whose possibilities as an ornithologist were secondary to the necessities of making a living but what he accomplished stamp him as far above the average bird student and had he been able to accept a position in the Philadelphia Academy, which had been offered him, his name might have been far more prominent in the list of our bird students.—C. W. G. Eifrig.

Owen Durfee, an Honorary Life Associate of the American Ornithologists' Union, died suddenly, on April 18, 1933, at his home in Fall River, Mass.

Born February 13, 1863, in New York City, he was the son of George Borden Durfee and Eliza Owen Borden, members of two of the oldest families then living in Fall River. He was educated in a private school, and, later, in the public schools of Fall River, and graduated from the Brooklyn Polytechnic Institute in 1884. Starting in business, in the real estate office of F. O. Dodge, Durfee later became identified with the Fall River Electric Light Co., in which Mr. Dodge was interested, and he remained with that company, in one position or another, the rest of his business life, until, as treasurer, he retired in 1921.

Mr. Durfee was married twice; on June 6, 1893 to Mary Katherine Bronson, who died December 10, 1913; and by whom he had three children, a girl and two boys who survive him; and to Harriet Tracy Marvell on May 22, 1919, who also survives.

He seems to have become interested in birds at an early age, as shown by his carefully written diary and notes, started at the age of sixteen. Always a very keen and careful observer, he confined his interest to New England birds, their habits and life histories, and gathered together a very beautiful collection of their nests and eggs, all collected by himself, and prepared with the greatest care. This collection he very generously presented, in 1925, to the Boston Society of Natural History, of which he was later elected an Honorary Life Member.

He was an Associate Member of the American Ornithologists' Union since 1887 and an Active Member of the Nuttall Ornithological Club since October 6, 1902, having previously been a Corresponding Member; and, whenever possible he attended the meetings, coming from Fall River to Cambridge in order to do so.

Always an outdoor man, taking his vacations in the spring, so he could spend his time with his beloved birds, and in hunting their nests, tragedy came into his life when, in the summer of 1920, he was stricken with arterial trouble in one of his legs, necessitating its amputation, only to have the same trouble appear later in his other leg, which he also lost.

Consigned thus, for the rest of his life, to a wheel chair, he showed the most unbelievable pluck and patience, never complaining, even to those who knew him best.

He kept up his interest in birds, however, in spite of his terribly crippled condition, and, at the time of his death was helping A. C. Bent, working over a large amount of egg data for the 'Life Histories of North American Birds.'—Fred H. Kennard.

Reuben Nelson Davis, an Associate of the American Ornithologists' Union since 1920, died at his home in Dunmore, Pa., January 28, 1934, at the age of 75. He was a son of Charles and Julia A. Sheldon Davis and was born on a farm at Lemon, Wyoming County, Pa., April 13, 1858. He was educated at the Wyoming Seminary, Kingston, Pa., and in 1902 received the honorary degree of Ph.B. from Illinois Wesleyan University. At the age of 17 he entered on the profession of teaching and for 37 years taught in several places in eastern Pennsylvania. For some time he was principal of the Archibald High School.

Mr. Davis was much interested in natural history, particularly in botany and ornithology. In 1912 he was appointed Curator of the Everhart Museum in Scranton, Pa., and in 1924 was made Director of the Museum. In 1921 he visited the Canal Zone in charge of the L. A. Watres Expedition and brought back a valuable collection of birds and botanical material from that region.

Mr. Davis did much to popularize the study of natural history in

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connection with his school and museum activities. He was an occasional contributor to 'The Auk,' and author of a publication on the 'Butterflies of Lackawanna County, Pa.,' 1914. In addition to membership in the Union he was a member of the American Association for the Advancement of Science, the American Association of Museums, and the Pennsylvania Academy of Science.—T. S. P.

ERRATUM. In an obituary notice in the January Auk of my old friend, Dr. Lemuel Fox Woodward, an error has crept in that deserves correction. It is said of Dr. Woodward that, while he was a student in the Lawrence Scientific School of Harvard University, he stroked the Varsity Crew. Actually, during each of the years that he was in Cambridge the stroke of the Varsity was one of the most famous oarsmen Harvard has produced—William Amos Bancroft.

I knew Woodward well during these years, and am well aware—as the published records of Harvard rowing substantiate—that, while he enjoyed the sport, his activities were limited to rowing in some of the minor crews, in 'club races' and scratch races, within the University. Indeed, the scientific work in which he was engaged was of so serious a character that he had little time for other pursuits.—C. F. B.

NOTES AND NEWS.

ATTENTION is again called to the Eighth International Ornithological Congress to be held at Oxford during the week of July 2–7, 1934, under the the presidency of Dr. Erwin Stresemann. Dr. P. R. Lowe of the British Museum is chairman of the Executive Committee and Rev. F. C. R. Jourdain, Secretary (Whitekirk, Southbourne, Bournemouth, England).

Excursions have been arranged to Lilford Hall, Fitzwarren and Whipsnade, at the invitation of Lord Lilford, Mr. Ezra and the Zoological Society, while after the close of the meeting an excursion will be made to the islands off the coast of Pembrokeshire to see the colonies of sea birds. President James H. Fleming will represent the A. O. U. and it is hoped that as many members as possible from America will attend.

WE REGRET to see such a magazine as 'Country Life' (Garden City, N. Y.) joining those who are bent on the destruction of our Hawks and Owls. It publishes in the December, 1933, issue, an article under the title of "Protecting the Pheasant" evidently by a professional 'game keeper' which is very misleading. "The Hawk" says the article, "does more damage than all the others [enemies of game] combined. During the migration this relentless bird of prey destroys thousands of pheasants, quail and partridge. I shoot or trap about five hundred every season. Some naturalists say that the Marsh Hawk is an innocent bird, but it kills more pheasants than the notorious Chicken Hawk (Red Tail)." This alone is enough to show the utter lack of knowledge of the writer as to the several species of Hawk!

There is an illustration of a Hawk suspended from a pole trap, an instrument that should be outlawed in every state in the Union. Another photograph depicts the Short-eared Owl, probably our most beneficial species. Under it is the information "Like the Hawk he must be trapped ruthlessly." When owners of large game estates and publishers encourage such misleading information there is little hope of educating the public and of saving the remnants of our Hawks and Owls. After they are gone then will come the realization of the mistake that has been made!

MR. AUGUST J. SCHOENEBECK, a founder of the Milwaukee Public Museum, died in January last at his home in Advance, Shawano Co., Wisconsin. He was a correspondent of the late Col. B. F. Goss and an oologist of note. His collection of upwards of 9000 specimens of North American eggs is now in St. Joseph's Catholic Academy at Stevens Point, Wis.

MR. PAUL G. REDINGTON has at his own request been transferred from the Biological Survey, of which he has been Chief for some years past, to the Forest Service. Mr. J. N. Darling a noted conservationist and a member of the President's Committee on wild life has been appointed Chief of the Survey.

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THE AUK

A Quarterly Journal of Ornithology

ORGAN OF THE AMERICAN ORNITHOLOGISTS' UNION

Edited by Dr. Witmer Stone

ACADEMY OF NATURAL SCIENCES, LOGAN SQUARE

PHILADELPHIA, PA.

To whom all articles and communications intended for publication and all books and publications for review should be sent.

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THE OFFICE OF PUBLICATION

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Subscriptions may also be sent to W. L. McAtee, Business Manager, 200 Cedar St., Cherrydale, Va. Foreign Subscribers may secure 'The Auk' through H. F. and G. Witherby, 326 High Holborn, London, W. C.

Subscription, $4.00 a year. Single numbers, one dollar.

Free to Honorary Fellows, and to Fellows, Members, and Associates of the A. O. U., not in arrears for dues.

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